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UNITED STATES DEPARTMENT OF AGRICULTURE
Food Distribution Administration

Report on the Frozen Meat Test from Chicago, Ill.,
to New York City via the New York Central System.

September 17 to September 23, 1943, inclusive

BY: H. D. Johnson
Agricultural Transportation Specialist

Washington, D. C.
October, 1943

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Report on the Frozen Meat Test from Chicago, Ill.,
to New York City via the New York Central System.

By: H. D. Johnson, Agricultural Transportation Specialist
Food Distribution Administration

During the last summer the Food Distribution Administration encountered considerable difficulty in connection with shipments of frozen meats from various points in the Middle West to the New York Harbor area for export. A large number of cars arrived with extremely high temperatures, showing a serious defrosted condition, which necessitated the refreezing of the lading in quick freezers in New York City.

The extra handling of these products caused serious congestion in the cold-storage houses in the New York City area, plus an added expense to our Administration of from \$100 to \$150 on each car so handled.

In a conference with staff members of the Food Distribution Administration, on account of the experiences indicated above, it was agreed that refrigerator cars equipped with brine tanks should be discontinued immediately because of inefficient refrigeration capacity. The basket type bunker refrigerator car, for the transportation of these frozen products, was recommended.

It was also suggested that precooling and transit refrigeration tests on 12 cars be made in order to definitely determine the proper type of refrigerator car to use not only for transporting frozen meat but for holding satisfactory temperatures while on track in the New York City area, under various percentages of ice and salt. Arrangements were made for the tests with the cooperation of the Bureau of Plant Industry, Soils and Agricultural Engineering. The test train left Chicago on September 17, 1943.

While the test cars were being loaded, distant reading electric resistant thermometers were inserted deep into the various kinds of meat packed in boxes set at various locations in the load as indicated in table No. 1. The thermometers were then attached to a master cable provided with

a door plate so that the cable could be brought out through the doorway without interfering with closing of the doors of the car. Temperatures were read from a point on top of the cars by plugging in a reading instrument box. Temperatures were read at frequent daily intervals during the transit period and during the time the cars were held on track in New York City.

Table No. 1 - Locations of thermometer bulbs were the same, along the southwall, in all 12 test cars; the positions were as follows:

- Bulb No. 1 - Air - located 1 inch above the floor rack in the center of the car at the bulkhead.
- Bulb No. 2 - Meat- bottom layer container side wall stack at the bulkhead.
- Bulb No. 3 - Air - 1 inch above the floor rack, side wall at bulkhead.
- Bulb No. 4 - Meat- top layer container side wall stack at the bulkhead.
- Bulb No. 5 - Air - 18 inches from the ceiling at the bulkhead.
- Bulb No. 6 - Meat- top layer quarter length from the bulkhead to the side door.
- Bulb No. 7 - Air - 18 inches from the ceiling at the center of the lading at the quarter length position.
- Bulb No. 8 - Meat- bottom layer along the side wall at the quarter length.
- Bulb No. 9 - Air - 18 inches from the ceiling along the side wall of the doorway.
- Bulb No. 10 - Meat- top layer along the side wall at the doorway.
- Bulb No. 11- Air - 1 inch above floor rack along the side wall at the doorway.
- Bulb No. 12- Meat- Bottom container at the door way.

(In the above where meat is mentioned, it is to be understood that the thermometer bulb was inserted deep into the meat.)

Crushed ice was used in all the test cars for the purpose of precooling because the packers who furnished the initial icing and the reicing after loading, were not equipped to supply coarse ice. All reicings in transit, and while being hold on track at New York City, were performed as follows: Coarse ice was used in the basket type bunker cars and Crushed ice in the cars equipped with the brine tanks.

A complete record of the amount of ice and salt furnished in each car is shown in Table No. 2.



ICING RECORD
FROZEN MEATS FROM CHICAGO, ILL. TO NEW YORK CITY

| PLACE | DATE SEPT. 1943 | ARL 11690 | | ARL 11628 | | MDT 8037 | | FGE 36713 | | FGE 38170 | | WCLX 8876 | |
|----------|-----------------------|--------------|------|--------------|------|-------------|------|--------------|------|--------------|------|--------------|------|
| | | Ice | Salt | Ice | Salt | Ice | Salt | Ice | Salt | Ice | Salt | Ice | Salt |
| | | Lbs./ | | Lbs./ | | Lbs./ | | Lbs./ | | Lbs./ | | Lbs./ | |
| | | | 1/ | | 2/ | | | | 4/ | | 4/ | | 3/ |
| Chicago | 16 | 4657 | 931 | 4710 | 472 | 10600 | 3400 | 10600 | 2120 | 10800 | 3240 | 6700 | 1340 |
| " | 17 | 1756 | 348 | 1358 | 135 | 1740 | 600 | 1200 | 240 | 1300 | 390 | 800 | 160 |
| " | 17 | 874 | 174 | 744 | 73 | | | | | | | | |
| Toledo | 18 | - | - | - | - | 1620 | 476 | 1970 | 394 | 1970 | 591 | 600 | 120 |
| Buffalo | 19 | - | - | - | - | 800 | 240 | 800 | 160 | 800 | 240 | 520 | 104 |
| Selkirk | 19 | - | - | 700 | 210 | 740 | 222 | 970 | 220 | 740 | 222 | 400 | 80 |
| New York | 21 | 2075 | 415 | 1420 | 534 | 1200 | 360 | 1400 | 280 | 2140 | 572 | 1000 | 200 |
| " | 23 | 1300 | 390 | 1500 | 450 | 2500 | 750 | 2000 | 400 | 2800 | 840 | 1020 | 204 |
| " | 24 | 900 | 270 | 1200 | 360 | 1500 | 450 | 1300 | 260 | 1150 | 345 | 800 | 160 |
| " | 25 | 1000 | 300 | 1000 | 300 | 1400 | 420 | 1500 | 300 | 1700 | 510 | 1100 | 220 |
| " | 26 | 1000 | 300 | 1075 | 322 | 1150 | 345 | 1100 | 220 | 1350 | 405 | 925 | 185 |
| " | 27 | 600 | 180 | 800 | 240 | 900 | 270 | 900 | 180 | 1050 | 315 | 500 | 100 |

| PLACE | DATE SEPT. 1943 | MDT 8087 | | FGE 38088 | | SRLX 2483 | | SRLX 2327 | | SRLX 4114 | | SRLX 3028 | |
|----------|-----------------------|-------------|------|--------------|------|--------------|------|--------------|------|--------------|------|--------------|------|
| | | Ice | Salt | Ice | Salt | Ice | Salt | Ice | Salt | Ice | Salt | Ice | Salt |
| | | Lbs./ | | Lbs./ | | Lbs./ | | Lbs./ | | Lbs./ | | Lbs./ | |
| | | | 4/ | | 4/ | | | | | | | | |
| Chicago | 16 | 12100 | 3630 | 10800 | 3240 | 7401 | 2220 | 6701 | 2010 | 6332 | 1265 | 7598 | 1520 |
| " | 17 | 1300 | 390 | 1500 | 450 | 2966 | 890 | 3399 | 1020 | 2747 | 548 | 2627 | 524 |
| Toledo | 18 | 1500 | 450 | 800 | 240 | 820 | 246 | 800 | 240 | 1000 | 200 | 800 | 160 |
| Buffalo | 19 | 800 | 240 | 820 | 246 | 400 | 120 | 850 | 255 | 800 | 160 | 450 | 90 |
| Selkirk | 19 | 770 | 231 | 740 | 222 | 540 | 162 | 550 | 165 | 600 | 120 | 570 | 114 |
| New York | 21 | 1500 | 450 | 1500 | 450 | 1200 | 360 | 1150 | 345 | 1450 | 290 | 790 | 158 |
| " | 23 | 2650 | 795 | 2650 | 795 | 1900 | 570 | 1700 | 510 | 1100 | 220 | 1300 | 260 |
| " | 24 | 1300 | 390 | 1450 | 435 | 900 | 270 | 1000 | 300 | 720 | 144 | 760 | 152 |
| " | 25 | 1150 | 345 | 1450 | 435 | 1400 | 420 | 1450 | 435 | 850 | 170 | 800 | 160 |
| " | 26 | 1000 | 300 | 950 | 285 | 800 | 240 | 975 | 292 | 650 | 130 | 675 | 135 |
| " | 27 | 700 | 210 | 600 | 180 | 700 | 210 | 900 | 270 | 575 | 115 | 475 | 95 |

NOTE: Coarse Ice used in all cars except ARL 11690; Arl 11628; SRLX 4114 and WCLX 8876 which were supplied with crushed ice.

- 1/ ARL 11690 in addition to icings, received a total of 736 gallons of 15° (70° Salometer) brine at initial icing and two topoffs.
- 2/ Arl 11627 in addition to icings, received a total of 791 gallons of 15° (70° Salometer) brine at initial icing and two topoffs.
- 3/ WCLX 8876 contained 18" of old brine which was not drained off when initially iced.
- 4/ Initially iced with "Pack-Ice" Bricquettes.



For a clearer understanding of the test, it appears desirable to define some of the terms used.

(See Appendix A attached)

The following table shows the number of hours of precooling, maximum air temperatures, and average air temperatures at the time the car doors were opened for loading:

AVERAGE AIR TEMPERATURES PRIOR TO INITIAL ICING

| 1943 | | ARL | ARL | IDT | MDT | FGE | FGE | FGE | SRL | SRL | SRL | SRL | WC1 |
|------|------------|-----------|-----------|-----------|------|-------|-------|-------|------|------|------|------|-----|
| Date | Time | 11690 | 11628 | 8037 | 8087 | 38088 | 38170 | 36713 | 2327 | 3028 | 2433 | 4114 | 887 |
| | | <u>2/</u> | <u>2/</u> | <u>1/</u> | | | | | | | | | |
| 9/16 | 8:00 A-Avg | | | | | | | | 60.2 | 58.4 | 61.7 | 60.9 | |
| 9/16 | 2:00 P " | | | 58.5 | 58.5 | 59.5 | 59.5 | 59.6 | | | | | 59. |

MAXIMUM AND AVERAGE AIR TEMPERATURES PRIOR TO LOADING

| | | | | | | | | | | | | | |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| 9/17 7:00 A-Mx | | | | | | 20.0 | 23.6 | | | | | | 29. |
| Av | | | | | | 17.1 | 19.7 | | | | | | 25. |
| 9/17 7:30 A-Mx | | | | 25.6 | | | | | 23.1 | 18.1 | 20.0 | 27.3 | |
| Av | | | | 21.6 | | | | | 17.7 | 15.3 | 17.4 | 24.4 | |
| 9/17 12:50 P-Mx | 26.8 | 29.3 | | | | | | | | | | | |
| Av | 23.4 | 26.1 | | | | | | | | | | | |
| 9/17 1:00 P-Mx | | | | | | 21.5 | | | | | | | |
| Av | | | | | | 16.0 | | | | | | | |
| 9/17 3:00 P-Mx | | | 20.6 | | | | | | | | | | |
| Av | | | 17.6 | | | | | | | | | | |
| Tem.Drop | | | 40.9 | 36.9 | 43.5 | 42.4 | 39.9 | 42.5 | 43.1 | 44.3 | 36.5 | 34. | |
| No. of hours cooled. | | | 26.0 | 19.5 | 23.0 | 17.0 | 17.0 | 23.5 | 23.5 | 23.5 | 23.5 | 17. | |

1/ No air temperature reading was taken prior to initial icing of this car, therefore 58.5 was used as a fair average.

2/ For ARL 11690 and ARL 11628, in arriving at the average air temperature for the precooling, 5 locations were used, as it appears that bulb No. 3 was not placed in its proper position. No air temperature reading was taken prior to initial icing of these two cars; therefore, no precooling temperatures are shown.

SPECIFICATIONS OF THE TEST CARS

| CAR NUMBER | INSIDE LENGTH | INSIDE WIDTH | INSIDE HEIGHT | TYPE OF BUNKER | BUNKER CAPACITY IN LBS. | AMOUNT OF INSULATION | | |
|------------|---------------|--------------|---------------|----------------|-------------------------|----------------------|--------|---------------|
| | | | | | | SIDES | FLOOR | ROOF ENDS |
| ARL 11690 | 31' 2" | 8' | 6' 2" | Brine Tank | 4,500 | 2½" | 2" | 3½" 2½" |
| ARL 11628 | 31' 2" | 8' | 6' 2" | Brine Tank | 4,500 | 2½" | 2" | 3½" 2½" |
| MDT 8087 | 33' 3" | 8' 3" | 7' 3" | Basket | 10,700 | 3-3/8" | 3-7/8" | 4½" 4½" |
| MDT 8037 | 33' 3" | 8' 3" | 7' 3" | Basket | 10,700 | 3-3/8" | 3-7/8" | 4½" 4½" |
| WCL 8876 | 29' 5½" | 8' 3" | 6' 4" | Combination/2/ | 6,720 | 2" | 2" | 3½" 2" |
| FGE 38088 | 33' 2-3/4" | 8' 3" | 7' 8-3/8" | Basket | 10,200 | 3" | 3½" | 3½" 3" |
| FGE 38170 | 33' 2-3/4" | 8' 3" | 7' 8-3/8" | Basket | 10,200 | 3" | 3½" | 3½" 3" |
| FGE 36713 | 33' 2-3/4" | 8' 4" | 7' 5½" | Basket /1/ | 10,200 | 2" | 2½" | 3" 2" |
| SRL 2327 | 29' 6" | 8' 4" | 7' 5" | Basket | 6,600 | 2-3/4" | 3" | 3" 2-3-4" |
| SRL 3028 | 29' 6" | 8' 3" | 7' 5" | Basket | 7,500 | 3-3/4" | 4" | 4½" 3-3-4" |
| SRL 2483 | 29' 6" | 8' 4" | 7' 5" | Basket | 6,600 | 2-3/4" | 3" | 3" 2-3-4" |
| SRL 4114 | 29' 5½" | 8' 3" | 7' 2" | Brine Tank | 6,000 | 3-3/4" | 4" | 4-3/4" 3-3-4" |

/1/ - Divided basket bunkers

/2/ - Combination basket bunker and brine tank

Precooling Method Used by Armour & Co.

After their two cars were initially iced to capacity, 15° F. brine was added to the ice in the tanks. A detailed description of the initial icing and reicing is shown as follows:

| | <u>Amount of ice</u> | <u>Amount of salt</u> | <u>Brine</u> |
|-----------------------------|----------------------|-----------------------|--------------|
| | Pounds | Pounds | Gallons |
| ARL 11690 | | | |
| 9/16/43 - 1:00 PM | 4,657 | 931 | 189 |
| 9/17/43 - 8:30 AM | 1,756 | 348 | 257 |
| After loading was completed | | | |
| 9/17/43 - | 874 | 174 | 290 |
| ARL 11628 | | | |
| 7/16/43 - 1:00 PM | 4,710 | 472 | 218 |
| 7/16/43 - 8:30 AM | 1,358 | 135 | 283 |
| After loading was completed | | | |
| | 744 | 73 | 290 |

Prior to each reicing, the brine was drained from the tanks and fresh cold brine was added.

- - - - -

The numbers of packages loaded in each car, indicating the gross weight as shown on the railroad waybills, are as follows:

| | |
|---|-------------|
| ARL 11690 - Armour & Co. - 197 bxs. frozen meat -- | 30,726 lbs. |
| ARL 11628 - Armour & Co. - 212 bxs. frozen meat -- | 33,121 lbs. |
| SRL 2327 - Swift & Co. - 149 bxs. frozen meat -- | 33,786 lbs. |
| SRL 2483 - Swift & Co. - 149 bxs. frozen meat -- | 34,186 lbs. |
| SRL 4114 - Swift & Co. - 149 bxs. frozen meat -- | 33,675 lbs. |
| SRL 3028 - Swift & Co. - 149 bxs. frozen meat -- | 33,600 lbs. |
| FGE 38170 - Wilson & Co. - 537 bxs. frozen meat -- | 32,730 lbs. |
| FGE 38088 - Wilson & Co. - 189 bxs. frozen meat -- | 41,054 lbs. |
| FGE 36713 - Wilson & Co. - 550 bxs. frozen meat -- | 32,747 lbs. |
| MDT 8087 - Wilson & Co. - 187 bxs. frozen meat -- | 40,768 lbs. |
| WCL 8876 - Wilson & Co. - 188 bxs. frozen meat -- | 41,160 lbs. |
| MDT 8037 - Rose Packing Company - 629 bxs. frozen meat -- | 33,160 lbs. |

- - - - -

The following tables show the outside temperatures, product and air temperatures inside of the cars, locations as indicated in table No. 1.

(See Tables Attached)

1. The first part of the report deals with the general conditions of the country.

2. The second part deals with the results of the survey.

3. The third part deals with the conclusions.

| | | |
|---|--|---|
| 1. The first part of the report deals with the general conditions of the country. | 2. The second part deals with the results of the survey. | 3. The third part deals with the conclusions. |
| 4. The fourth part deals with the recommendations. | 5. The fifth part deals with the summary. | 6. The sixth part deals with the appendix. |

4. The fourth part deals with the recommendations.

| | | |
|---|--|---|
| 7. The seventh part deals with the bibliography. | 8. The eighth part deals with the index. | 9. The ninth part deals with the list of figures. |
| 10. The tenth part deals with the list of tables. | 11. The eleventh part deals with the list of maps. | 12. The twelfth part deals with the list of plates. |

13. The thirteenth part deals with the list of references.

14. The fourteenth part deals with the list of abbreviations.

15. The fifteenth part deals with the list of symbols.

16. The sixteenth part deals with the list of footnotes.

| | | |
|---|---|--|
| 17. The seventeenth part deals with the list of references. | 18. The eighteenth part deals with the list of abbreviations. | 19. The nineteenth part deals with the list of symbols. |
| 20. The twentieth part deals with the list of footnotes. | 21. The twenty-first part deals with the list of references. | 22. The twenty-second part deals with the list of abbreviations. |
| 23. The twenty-third part deals with the list of symbols. | 24. The twenty-fourth part deals with the list of footnotes. | 25. The twenty-fifth part deals with the list of references. |
| 26. The twenty-sixth part deals with the list of abbreviations. | 27. The twenty-seventh part deals with the list of symbols. | 28. The twenty-eighth part deals with the list of footnotes. |
| 29. The twenty-ninth part deals with the list of references. | 30. The thirtieth part deals with the list of abbreviations. | 31. The thirty-first part deals with the list of symbols. |
| 32. The thirty-second part deals with the list of footnotes. | 33. The thirty-third part deals with the list of references. | 34. The thirty-fourth part deals with the list of abbreviations. |
| 35. The thirty-fifth part deals with the list of symbols. | 36. The thirty-sixth part deals with the list of footnotes. | 37. The thirty-seventh part deals with the list of references. |
| 38. The thirty-eighth part deals with the list of abbreviations. | 39. The thirty-ninth part deals with the list of symbols. | 40. The fortieth part deals with the list of footnotes. |
| 41. The forty-first part deals with the list of references. | 42. The forty-second part deals with the list of abbreviations. | 43. The forty-third part deals with the list of symbols. |
| 44. The forty-fourth part deals with the list of footnotes. | 45. The forty-fifth part deals with the list of references. | 46. The forty-sixth part deals with the list of abbreviations. |
| 47. The forty-seventh part deals with the list of symbols. | 48. The forty-eighth part deals with the list of footnotes. | 49. The forty-ninth part deals with the list of references. |
| 50. The fiftieth part deals with the list of abbreviations. | 51. The fifty-first part deals with the list of symbols. | 52. The fifty-second part deals with the list of footnotes. |
| 53. The fifty-third part deals with the list of references. | 54. The fifty-fourth part deals with the list of abbreviations. | 55. The fifty-fifth part deals with the list of symbols. |
| 56. The fifty-sixth part deals with the list of footnotes. | 57. The fifty-seventh part deals with the list of references. | 58. The fifty-eighth part deals with the list of abbreviations. |
| 59. The fifty-ninth part deals with the list of symbols. | 60. The sixtieth part deals with the list of footnotes. | 61. The sixty-first part deals with the list of references. |
| 62. The sixty-second part deals with the list of abbreviations. | 63. The sixty-third part deals with the list of symbols. | 64. The sixty-fourth part deals with the list of footnotes. |
| 65. The sixty-fifth part deals with the list of references. | 66. The sixty-sixth part deals with the list of abbreviations. | 67. The sixty-seventh part deals with the list of symbols. |
| 68. The sixty-eighth part deals with the list of footnotes. | 69. The sixty-ninth part deals with the list of references. | 70. The seventieth part deals with the list of abbreviations. |
| 71. The seventy-first part deals with the list of symbols. | 72. The seventy-second part deals with the list of footnotes. | 73. The seventy-third part deals with the list of references. |
| 74. The seventy-fourth part deals with the list of abbreviations. | 75. The seventy-fifth part deals with the list of symbols. | 76. The seventy-sixth part deals with the list of footnotes. |
| 77. The seventy-seventh part deals with the list of references. | 78. The seventy-eighth part deals with the list of abbreviations. | 79. The seventy-ninth part deals with the list of symbols. |
| 80. The eightieth part deals with the list of footnotes. | 81. The eighty-first part deals with the list of references. | 82. The eighty-second part deals with the list of abbreviations. |
| 83. The eighty-third part deals with the list of symbols. | 84. The eighty-fourth part deals with the list of footnotes. | 85. The eighty-fifth part deals with the list of references. |
| 86. The eighty-sixth part deals with the list of abbreviations. | 87. The eighty-seventh part deals with the list of symbols. | 88. The eighty-eighth part deals with the list of footnotes. |
| 89. The eighty-ninth part deals with the list of references. | 90. The ninetieth part deals with the list of abbreviations. | 91. The ninety-first part deals with the list of symbols. |
| 92. The ninety-second part deals with the list of footnotes. | 93. The ninety-third part deals with the list of references. | 94. The ninety-fourth part deals with the list of abbreviations. |
| 95. The ninety-fifth part deals with the list of symbols. | 96. The ninety-sixth part deals with the list of footnotes. | 97. The ninety-seventh part deals with the list of references. |
| 98. The ninety-eighth part deals with the list of abbreviations. | 99. The ninety-ninth part deals with the list of symbols. | 100. The hundredth part deals with the list of footnotes. |

101. The hundredth part deals with the list of references.

102. The hundredth part deals with the list of abbreviations.

103. The hundredth part deals with the list of symbols.

AIR AND COMMODITY TEMPERATURES RECORDED FROM DAILY READINGS

FROZEN MEATS FROM CHICAGO, ILL., TO NEW YORK CITY, N.Y.

CAR ARLX 11690

| PLACE | DATE SEPT. 1943 | TIME | OUT- SIDE TEMP. | -----BUNKER----- | | | | QUARTER LENGTH | | | | -----DOORWAY----- | | | |
|----------------|-----------------------|---------|-----------------------|---------------------|----------------------|--------------------|---------------------|---------------------|----------------------|--------------------|---------------------|---------------------|----------------------|--------------------|---------------------|
| | | | | AIR BOT. C.L. | COM. BOT. SIDE | AIR TOP SIDE | COM. TOP SIDE | AIR BOT. C.L. | COM. BOT. SIDE | AIR TOP SIDE | COM. TOP SIDE | AIR BOT. SIDE | COM. BOT. SIDE | AIR TOP SIDE | COM. TOP SIDE |
| | | | | | | | | | | | | | | | |
| Chicago | 16 | 8:00 P | 54 | | | | | | | | | | | | |
| " | 17 | 8:00 A | 56 | | | | | | | | | | | | |
| " | 17 | 12:50 P | 57 | 16.8 | | | | | | | | | | | |
| " | 17 | 6:30 P | 57 | 18.1 | 8.7 | 23.5 | 3.6 | 41.5 | 11.7 | 43.7 | 3.1 | 29.2 | 42.0 | 37.7 | 37.7 |
| " | 18 | 12:15 A | 50 | | 8.2 | 20.5 | 6.6 | 6.1 | 11.4 | 21.3 | 3.8 | 18.0 | 29.2 | 26.7 | 26.7 |
| Toldeo, O. | 18 | 9:15 A | 50 | 11.7 | 9.7 | 20.5 | 10.4 | 11.9 | 11.7 | 18.6 | 5.2 | 18.4 | 26.2 | 23.7 | 23.7 |
| Cleveland, O. | 18 | 4:45 P | 60 | 12.3 | 11.4 | 20.9 | 9.7 | 8.9 | 12.0 | 19.0 | 6.5 | 19.6 | 29.2 | 41.7 | 11.7 |
| Buffalo, N.Y. | 19 | 1:30 A | 50 | 13.8 | 13.7 | 23.1 | 11.4 | 7.5 | 13.4 | 20.2 | 8.2 | 20.0 | 12.5 | 19.7 | 9.9 |
| Syracuse, N.Y. | 19 | 11:15 A | 67 | 14.5 | 15.9 | 23.7 | 13.0 | 8.9 | 14.2 | 20.2 | 9.4 | 19.8 | 12.1 | 17.9 | 10.8 |
| Selkirk, N.Y. | 19 | 9:00 P | 53 | 15.4 | 15.6 | 23.5 | 14.1 | 9.6 | 14.8 | 22.1 | 10.5 | 21.5 | 12.8 | 18.0 | 11.8 |
| New York City | 20 | 10:00 A | 66 | 16.7 | 17.0 | 24.5 | 15.9 | 11.6 | 16.2 | 22.9 | 11.7 | 22.4 | 14.2 | 19.5 | 13.1 |
| " | 20 | 5:00 P | 71 | 17.7 | 17.2 | 25.0 | 16.6 | 12.4 | 17.0 | 24.0 | 12.8 | 23.1 | 14.6 | 19.7 | 14.1 |
| " | 21 | 11:00 A | 70 | 13.8 | 17.7 | 24.5 | 17.6 | 13.4 | 18.2 | 25.5 | 14.8 | 24.5 | 15.5 | 21.2 | 14.7 |
| " | 21 | 6:15 P | 68 | 20.2 | 20.2 | 23.1 | 19.7 | 17.2 | 20.8 | 30.0 | 16.7 | 25.6 | 16.5 | 22.4 | 16.1 |
| " | 22 | 10:00 A | 66 | 18.4 | 19.5 | 24.3 | 19.9 | 19.0 | 21.2 | 27.2 | 18.3 | 26.9 | 17.3 | 23.1 | 16.7 |
| " | 22 | 6:30 P | 70 | 18.3 | 19.7 | 24.0 | 20.1 | 20.1 | 21.7 | 28.5 | 19.3 | 28.0 | 18.5 | 24.7 | 17.7 |
| " | 23 | 11:00 A | 78 | 19.3 | 20.7 | 25.0 | 21.6 | 21.6 | 23.7 | 30.0 | 21.3 | 30.0 | 20.5 | 28.7 | 19.7 |
| " | 24 | 4:00 P | 84 | 19.3 | 20.7 | 24.5 | 21.6 | 22.1 | 23.7 | 30.5 | 21.8 | 30.5 | 21.5 | 26.7 | 20.6 |
| " | 24 | 11:00 A | 65 | 16.8 | 18.8 | 21.8 | 21.6 | 23.3 | 24.1 | 28.7 | 22.1 | 31.0 | 22.0 | 27.7 | 21.2 |
| " | 24 | 6:00 P | 64 | 17.6 | 19.2 | 22.6 | 21.2 | 23.1 | 23.7 | 28.9 | 22.4 | 30.9 | 23.5 | 29.2 | 23.2 |
| " | 25 | 7:45 A | 52 | 18.1 | 19.2 | 22.5 | 20.8 | 23.4 | 23.5 | 28.1 | 22.6 | 30.0 | 24.0 | 29.7 | 23.2 |
| " | 25 | 4:00 P | 60 | 18.5 | 19.7 | 23.0 | 21.7 | 24.1 | 24.2 | 29.1 | 23.0 | 30.1 | 24.5 | 28.1 | 24.7 |
| " | 26 | 8:15 A | 50 | 16.3 | 18.5 | 21.0 | 21.4 | 24.0 | 24.0 | 26.5 | 22.9 | 28.0 | 24.4 | 27.7 | 24.8 |
| " | 26 | 3:00 P | 67 | 15.9 | 18.2 | 20.5 | 20.5 | 23.1 | 23.5 | 26.4 | 22.8 | 26.5 | 25.4 | 28.6 | 25.7 |
| " | 27 | 8:00 A | 56 | 15.9 | 18.4 | 20.9 | 20.8 | 24.4 | 24.2 | 27.5 | 23.3 | 30.0 | 24.6 | 26.4 | 25.3 |
| " | 27 | 2:30 P | 74 | 15.3 | 17.7 | 20.4 | 20.6 | 23.7 | 23.6 | 28.1 | 25.6 | 30.9 | 25.6 | 27.6 | 26.7 |
| " | 28 | 7:30 A | 56 | 15.4 | 17.5 | 20.4 | 20.5 | 24.4 | 24.2 | 24.0 | 23.8 | 32.8 | 26.7 | 28.7 | 27.0 |

Note: During car precooling period, before loading, all thermometers about 18" below ceiling (ARLX 11690 and 11628)

AIR AND COMMODITY TEMPERATURES RECORDED FROM DAILY READINGS

FROZEN MEATS FROM CHICAGO, ILL., TO NEW YORK CITY, N. Y.

CAR ARLX 11628

| PLACE | DATE SEPT. 1943 | TIME | OUT- SIDE TEMP. | BUNKER | | | | | | QUARTER LENGTH | | | | | | DOORWAY | | | | | | | | | | | |
|----------------|-----------------------|-------|-----------------------|-------------|--------------|-------------|--------------|-------------|--------------|----------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|--------------|
| | | | | 1/ | | 2/ | | 3/ | | 4/ | | 5/ | | 6/ | | 7/ | | 8/ | | 9/ | | 10/ | | 11/ | | 12/ | |
| | | | | AIR BOT. | COM. C.L. | AIR BOT. | COM. SIDE | AIR BOT. | COM. SIDE | AIR TOP | COM. SIDE | AIR TOP | COM. SIDE | AIR TOP | COM. SIDE | AIR TOP | COM. C.L. | AIR TOP | COM. SIDE | AIR TOP | COM. SIDE | AIR TOP | COM. SIDE | AIR TOP | COM. SIDE | AIR TOP | COM. SIDE |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Chicago | 16 | 6:00 | P 54 | 28.0 | 39.5 | | | | | 41.9 | | | | | 38.9 | | | | 42.9 | | | | 39.0 | | | | |
| " | 17 | 8:00 | P 56 | 23.8 | 30.5 | | | | | 31.6 | | | | | 30.2 | | | | 32.8 | | | | 29.8 | | | | |
| " | 17 | 12:50 | P 57 | 20.4 | 27.2 | | | | | 28.1 | | | | | 26.8 | | | | 29.3 | | | | 26.0 | | | | |
| " | 17 | 6:30 | P 57 | 13.8 | 13.7 | 16.0 | 18.3 | 15.7 | 14.9 | 22.4 | 8.1 | 21.9 | 11.0 | 13.0 | 28.2 | 13.0 | 11.0 | 19.2 | 23.1 | 9.7 | 11.4 | 26.7 | 25.0 | 2.6 | 4.7 | | |
| " | 18 | 12:15 | A 50 | - | 15.0 | 15.7 | 14.9 | 15.0 | 14.9 | 22.4 | 8.1 | 21.9 | 11.0 | 13.0 | 28.2 | 13.0 | 11.0 | 19.2 | 23.1 | 9.7 | 11.4 | 26.7 | 25.0 | 2.6 | 4.7 | | |
| Toledo, O. | 18 | 9:15 | A 50 | 16.3 | 17.3 | 20.4 | 15.0 | 19.6 | 10.7 | 20.3 | 11.3 | 20.7 | 11.8 | 13.4 | 20.5 | 11.3 | 20.7 | 11.8 | 18.5 | 12.7 | 18.0 | 6.4 | 6.4 | 6.4 | 6.4 | | |
| Cleveland, O. | 18 | 4:45 | P 60 | 14.3 | 18.0 | 20.7 | 16.5 | 20.5 | 11.3 | 20.7 | 11.3 | 20.7 | 11.8 | 13.4 | 20.5 | 11.3 | 20.7 | 11.8 | 19.1 | 14.2 | 20.2 | 8.1 | 8.1 | 8.1 | 8.1 | | |
| Buffalo, N. Y. | 19 | 1:30 | A 50 | 15.0 | 19.1 | 19.8 | 17.9 | 21.7 | 13.0 | 21.9 | 13.4 | 22.1 | 14.2 | 15.2 | 22.4 | 18.4 | 28.9 | 12.8 | 22.4 | 19.2 | 26.3 | 14.4 | 14.4 | 14.4 | 14.4 | | |
| Syracuse, N.Y. | 19 | 11:15 | A 67 | 15.2 | 19.7 | 21.4 | 18.3 | 21.5 | 14.3 | 22.1 | 14.2 | 15.2 | 15.2 | 16.9 | 22.3 | 19.3 | 30.5 | 14.7 | 22.3 | 19.3 | 30.5 | 14.7 | 22.3 | 19.3 | 30.5 | | |
| Selkirk, N. Y. | 19 | 9:00 | P 53 | 16.5 | 20.6 | 20.8 | 19.4 | 24.0 | 15.7 | 24.1 | 15.2 | 15.2 | 15.2 | 16.9 | 22.3 | 19.3 | 30.5 | 14.7 | 22.3 | 19.3 | 30.5 | 14.7 | 22.3 | 19.3 | 30.5 | | |
| New York City | 20 | 10:00 | A 66 | 16.4 | 19.7 | 17.5 | 19.0 | 22.9 | 17.1 | 23.8 | 16.9 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | | |
| " | 20 | 5:00 | P 71 | 17.7 | 18.9 | 17.7 | 21.2 | 23.2 | 16.9 | 23.8 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | | |
| " | 21 | 11:00 | A 70 | 19.5 | 18.5 | 18.2 | 20.9 | 25.9 | 18.2 | 26.9 | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 | | |
| " | 21 | 6:15 | P 68 | 19.2 | 20.6 | 21.2 | 23.5 | 30.4 | 20.5 | 30.8 | 20.4 | 20.4 | 20.4 | 20.4 | 20.4 | 20.4 | 20.4 | 20.4 | 20.4 | 20.4 | 20.4 | 20.4 | 20.4 | 20.4 | 20.4 | | |
| " | 22 | 10:00 | A 66 | 16.4 | 19.7 | 17.1 | 21.8 | 27.6 | 21.0 | 28.7 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | | |
| " | 22 | 6:30 | P 70 | 15.5 | 19.5 | 16.4 | 22.4 | 28.4 | 21.7 | 29.9 | 22.9 | 22.9 | 22.9 | 22.9 | 22.9 | 22.9 | 22.9 | 22.9 | 22.9 | 22.9 | 22.9 | 22.9 | 22.9 | 22.9 | 22.9 | | |
| " | 23 | 11:00 | A 78 | 14.5 | 19.0 | 15.7 | 24.9 | 30.9 | 23.2 | 31.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | | |
| " | 23 | 4:00 | P 84 | 12.5 | 18.5 | 13.7 | 24.9 | 31.4 | 23.2 | 32.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | | |
| " | 24 | 11:00 | A 65 | 13.6 | 16.9 | 13.7 | 22.2 | 27.4 | 22.7 | 29.2 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | | |
| " | 24 | 6:00 | P 64 | 13.3 | 17.3 | 14.8 | 22.7 | 28.4 | 23.8 | 29.8 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | | |
| " | 25 | 7:45 | A 52 | 13.1 | 17.2 | 14.7 | 22.4 | 27.6 | 23.6 | 28.9 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | | |
| " | 25 | 4:00 | P 60 | 13.4 | 17.2 | 14.4 | 22.9 | 27.5 | 23.8 | 29.0 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | | |
| " | 26 | 8:15 | A 50 | 9.9 | 15.5 | 10.8 | 21.3 | 25.4 | 23.7 | 26.9 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | | |
| " | 26 | 3:00 | P 67 | 9.9 | 15.4 | 10.8 | 21.3 | 25.3 | 23.6 | 26.9 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | | |
| " | 27 | 8:00 | A 56 | 11.5 | 15.5 | 12.9 | 21.8 | 26.4 | 23.5 | 27.8 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | | |
| " 60 St. | 27 | 4:00 | P 74 | 11.2 | 15.6 | 12.8 | 21.4 | 26.3 | 23.8 | 27.9 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | | |
| " | 28 | 7:30 | A 56 | 10.9 | 14.9 | 11.6 | 22.0 | 28.3 | 23.9 | 29.8 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | | |

Note: During car precooling period, before loading, all thermometers about 18° below ceiling (ARLX 11690 and 11628)

AIR AND COMMODITY TEMPERATURES RECORDED FROM DAILY READINGS
FROZEN MEATS FROM CHICAGO, ILL., TO NEW YORK CITY, N. Y.

CAR WCLX 8876

| PLACE | DATE SEPT. 1943 | TIME | OUT- SIDE TEMP. | BUNKER | | | | | | QUARTER LENGTH | | | | | | DOORWAY | | | | | |
|----------------|-----------------------|-------|-----------------------|--------------|------|--------------|------|--------------|------|----------------|------|--------------|------|--------------|------|-------------|-------------|-------------|-------------|-------------|-------------|
| | | | | AIR | | COM. | | AIR | | COM. | | AIR | | COM. | | AIR | | COM. | | AIR | |
| | | | | BOT. C.L. | SIDE | BOT. C.L. | SIDE | BOT. C.L. | SIDE | BOT. C.L. | SIDE | BOT. C.L. | SIDE | BOT. C.L. | SIDE | TOP SIDE | TOP SIDE | TOP SIDE | TOP SIDE | TOP SIDE | TOP SIDE |
| Chicago | 16 | 2:00 | P 59 | 59.8 | 58.6 | | | 60.5 | | | | 59.1 | | | | 59.3 | | | | 59.3 | |
| " | 16 | 5:15 | P 62 | 31.6 | 30.6 | | | 40.5 | | | | 40.4 | | | | 40.1 | | | | 34.3 | |
| " | 16 | 6:45 | P 54 | 24.1 | 27.1 | | | 36.7 | | | | 35.7 | | | | 35.9 | | | | 31.0 | |
| " | 16 | 10:00 | P 56 | 21.6 | 24.1 | | | 33.5 | | | | 32.4 | | | | 32.6 | | | | 28.3 | |
| " | 17 | 7:00 | A 54 | 19.8 | 21.6 | | | 29.1 | | | | 28.2 | | | | 28.1 | | | | 25.1 | |
| " | 17 | 6:00 | P 57 | 9.6 | 8.2 | | | 15.0 | | | | 14.9 | | | | 20.6 | | | | 8.7 | |
| " | 17 | 10:30 | P 54 | 8.0 | 9.7 | | | 13.2 | | | | 18.4 | | | | 19.7 | | | | 10.0 | |
| Toledo, Ohio | 18 | 9:15 | A 51 | 7.4 | 8.2 | | | 12.0 | | | | 16.5 | | | | 17.1 | | | | 9.5 | |
| Cleveland, O. | 18 | 4:45 | P 60 | 8.2 | 8.3 | | | 11.8 | | | | 16.8 | | | | 16.9 | | | | 11.0 | |
| Buffalo, N.Y. | 19 | 1:30 | A 50 | 10.4 | 9.7 | | | 13.0 | | | | 16.4 | | | | 17.4 | | | | 13.0 | |
| Syracuse, N.Y. | 19 | 11:15 | A 67 | 10.4 | 10.0 | | | 12.7 | | | | 16.0 | | | | 17.1 | | | | 12.5 | |
| Selkirk, N.Y. | 19 | 8:45 | P 53 | 13.1 | 12.4 | | | 15.2 | | | | 18.9 | | | | 20.2 | | | | 15.3 | |
| New York City | 20 | 10:00 | A 66 | 12.7 | 11.7 | | | 14.4 | | | | 17.6 | | | | 18.9 | | | | 15.2 | |
| " | 20 | 5:00 | P 71 | 13.6 | 12.2 | | | 15.0 | | | | 18.2 | | | | 19.6 | | | | 15.6 | |
| " | 21 | 11:00 | A 70 | 15.1 | 13.2 | | | 16.5 | | | | 20.9 | | | | 21.1 | | | | 16.7 | |
| " | 21 | 6:10 | P 68 | 15.3 | 14.6 | | | 17.5 | | | | 22.9 | | | | 23.0 | | | | 18.4 | |
| " | 22 | 10:00 | A 66 | 16.3 | 15.1 | | | 18.6 | | | | 22.5 | | | | 23.3 | | | | 20.0 | |
| " | 22 | 6:30 | P 70 | 16.7 | 15.7 | | | 19.0 | | | | 23.4 | | | | 24.6 | | | | 20.2 | |
| " | 23 | 11:00 | A 78 | 18.1 | 17.7 | | | 20.0 | | | | 24.9 | | | | 25.1 | | | | 21.2 | |
| " | 23 | 4:00 | P 84 | 17.1 | 16.7 | | | 21.0 | | | | 25.4 | | | | 26.1 | | | | 21.7 | |
| " | 24 | 11:00 | A 65 | 15.6 | 17.0 | | | 21.0 | | | | 24.7 | | | | 25.1 | | | | 22.0 | |
| " | 24 | 6:00 | P 64 | 15.0 | 16.9 | | | 21.1 | | | | 25.3 | | | | 25.2 | | | | 22.4 | |
| " | 25 | 7:45 | A 52 | 14.6 | 16.8 | | | 21.1 | | | | 25.0 | | | | 25.0 | | | | 23.0 | |
| " | 25 | 4:00 | P 60 | 14.8 | 16.8 | | | 21.3 | | | | 25.2 | | | | 25.2 | | | | 23.1 | |
| " | 26 | 8:15 | A 50 | 14.3 | 16.1 | | | 21.0 | | | | 24.3 | | | | 24.1 | | | | 23.0 | |
| " | 26 | 3:00 | P 67 | 14.6 | 16.6 | | | 21.1 | | | | 23.8 | | | | 24.7 | | | | 23.1 | |
| " | 27 | 8:00 | A 56 | 13.7 | 15.7 | | | 21.2 | | | | 23.6 | | | | 24.7 | | | | 23.5 | |
| " 60th St | 27 | 4:00 | P 74 | 12.6 | 15.5 | | | 21.2 | | | | 23.4 | | | | 25.0 | | | | 24.1 | |
| " | 28 | 7:30 | A 56 | 14.1 | 16.7 | | | 22.8 | | | | 26.4 | | | | 26.3 | | | | 25.2 | |
| " | | | | | | | | 27.0 | | | | 28.1 | | | | 28.3 | | | | 24.5 | |
| " | | | | | | | | | | | | | | | | | | | | 27.8 | |

AIR AND COMMODITY TEMPERATURES RECORDED FROM DAILY READINGS
FROZEN MEATS FROM CHICAGO, ILL., TO NEW YORK CITY, N.Y.

CAR MDT 8687

| PLACE | DATE SEPT. 1943 | TIME | OUT- SIDE TEMP. | BUNKER | | | QUARTER LENGTH | | | | DOORWAY | | | |
|----------------|-----------------------|---------|-----------------------|---------------------|----------------------|--------------------|----------------------|--------------------|----------------------|--------------------|---------------------|---------------------|----------------------|--|
| | | | | AIR BOT. C.L. | COM. BOT. SIDE | AIR TOP SIDE | COM. STOP SIDE | AIR TOP C.L. | COM. BOT. SIDE | AIR TOP SIDE | COM. TOP SIDE | AIR BOT. SIDE | COM. BOT. SIDE | |
| Chicago | 16 | 2:00 P | 59 | 57.9 | 57.8 | 59.0 | 57.7 | 57.9 | 57.3 | 57.9 | 57.3 | 57.3 | 57.3 | |
| " | 16 | 5:15 P | 62 | 40.0 | 40.5 | 47.1 | 45.3 | 44.8 | 39.1 | 44.8 | 39.1 | 39.1 | 39.1 | |
| " | 16 | 10:00 P | 56 | 24.0 | 25.0 | 33.1 | 31.3 | 30.3 | 27.1 | 30.3 | 27.1 | 27.1 | 27.1 | |
| " | 17 | 7:00 A | 54 | 18.5 | 19.0 | 25.6 | 23.3 | 23.0 | 20.3 | 23.0 | 20.3 | 20.3 | 20.3 | |
| " | 17 | 9:45 A | 56 | | | | | | | | | | | |
| " | 17 | 3:00 P | 64 | 7.0 | 4.8 | 26.1 | 6.5 | 26.8 | 1.4 | 20.8 | 3.8 | 9.1 | -2.1 | |
| " | 17 | 4:30 P | 63 | | | | | | | | | | | |
| " | 17 | 10:30 P | 55 | 3.8 | 1.8 | 14.8 | 5.9 | 12.3 | 5.9 | 12.3 | 5.9 | 3.6 | 0.4 | |
| Toledo, O. | 18 | 9:15 A | 50 | 3.6 | 2.7 | 15.0 | 7.1 | 11.6 | 12.1 | 12.0 | 5.7 | 5.6 | 1.9 | |
| Cleveland, O. | 18 | 4:45 P | 60 | 2.5 | 2.8 | 14.1 | 7.9 | 12.2 | 11.7 | 12.1 | 6.8 | 6.0 | 3.5 | |
| Buffalo, N.Y. | 19 | 1:30 P | 50 | 2.5 | 3.3 | 14.6 | 8.9 | 12.9 | 11.9 | 12.2 | 7.9 | 6.8 | 4.5 | |
| Syracuse, N.Y. | 19 | 11:15 A | 67 | 1.7 | 2.7 | 12.9 | 8.7 | 11.3 | 10.9 | 10.8 | 8.1 | 7.7 | 6.4 | |
| Selkirk, N.Y. | 19 | 9:00 P | 53 | 1.0 | 3.1 | 16.8 | 9.7 | 14.1 | 11.0 | 13.3 | 8.7 | 7.5 | 6.1 | |
| New York City | 20 | 10:00 A | 66 | 2.8 | 4.5 | 15.3 | 11.4 | 14.0 | 12.4 | 13.6 | 10.3 | 8.7 | 8.3 | |
| " | 20 | 5:00 P | 71 | 3.7 | 4.6 | 18.1 | 11.7 | 15.8 | 12.4 | 14.7 | 11.0 | 9.4 | 8.6 | |
| " | 21 | 11:00 A | 70 | 3.5 | 4.8 | 18.1 | 13.0 | 16.8 | 12.9 | 14.8 | 12.5 | 9.6 | 8.9 | |
| " | 21 | 6:15 P | 68 | 4.3 | 6.8 | 22.2 | 15.4 | 20.4 | 14.8 | 20.2 | 14.2 | 11.5 | 11.1 | |
| " | 22 | 10:00 A | 66 | 5.0 | 6.8 | 19.2 | 15.4 | 17.9 | 14.9 | 16.8 | 14.9 | 11.2 | 12.1 | |
| " | 22 | 6:30 P | 70 | 5.5 | 7.3 | 20.6 | 15.5 | 18.8 | 14.9 | 17.8 | 15.0 | 11.6 | 12.9 | |
| " | 23 | 11:00 A | 78 | 5.0 | 6.8 | 21.6 | 16.0 | 19.3 | 14.9 | 17.8 | 15.5 | 12.1 | 13.4 | |
| " | 23 | 4:00 P | 84 | 6.6 | 8.8 | 24.6 | 17.5 | 23.3 | 15.4 | 23.3 | 16.5 | 13.6 | 13.9 | |
| " | 24 | 11:00 A | 65 | 6.0 | 8.1 | 20.1 | 16.7 | 18.6 | 15.7 | 17.5 | 16.0 | 17.1 | 14.4 | |
| " | 24 | 6:00 P | 64 | 6.5 | 8.7 | 21.7 | 17.6 | 20.4 | 15.5 | 19.4 | 17.0 | 12.4 | 15.1 | |
| " | 25 | 7:45 A | 52 | 6.1 | 8.1 | 20.0 | 16.9 | 18.0 | 14.9 | 17.2 | 16.4 | 11.1 | 14.0 | |
| " | 25 | 4:00 P | 50 | 6.1 | 8.4 | 20.4 | 17.5 | 19.2 | 15.0 | 18.8 | 17.0 | 11.3 | 14.6 | |
| " | 26 | 8:15 A | 60 | 5.8 | 7.6 | 18.6 | 16.8 | 17.4 | 14.0 | 16.4 | 16.4 | 10.3 | 13.8 | |
| " | 26 | 3:00 P | 67 | 5.9 | 8.3 | 19.8 | 17.0 | 18.2 | 14.2 | 17.9 | 16.8 | 10.7 | 13.9 | |
| " | 27 | 8:00 A | 56 | 5.5 | 8.1 | 19.9 | 17.3 | 17.7 | 13.9 | 17.2 | 16.6 | 11.3 | 14.1 | |
| " | 27 | 4:00 P | 74 | 6.9 | 8.9 | 22.0 | 18.6 | 20.2 | 14.7 | 19.3 | 17.8 | 12.0 | 14.8 | |
| " | 28 | 7:30 A | 56 | 6.5 | 8.8 | 22.0 | 16.9 | 20.3 | 15.7 | 19.5 | 18.2 | 10.3 | 15.8 | |

AIR AND COMMODITY TEMPERATURES RECORDED FROM DAILY READINGS

FROZEN MEATS FROM CHICAGO, ILL., TO NEW YORK CITY, N.Y.

CAR MDT 8037

| PLACE | DATE SEPT 1943 | TIME | OUT- SIDE TEMP. | -----BUNKER----- | | | | | QUARTER LENGTH | | | | | -----DOORWAY----- | | | | |
|----------------|----------------------|---------|-----------------------|------------------|------------|------------|------------|------------|----------------|------------|------------|------------|-------------|-------------------|-------------|-------------|-------------|--|
| | | | | AIR | COM. | AIR | COM. | AIR | COM. | AIR | COM. | AIR | COM. | AIR | COM. | AIR | COM. | |
| | | | | BOT. C.L. | 2/ SIDE | 3/ SIDE | 4/ SIDE | 5/ SIDE | 6/ SIDE | 7/ C.L. | 8/ SIDE | 9/ SIDE | 10/ SIDE | 11/ SIDE | 12/ SIDE | 13/ SIDE | 14/ SIDE | |
| Chicago | 16 | 2:00 P | 59 | | | 21.2 | | 21.1 | 18.6 | | | 18.6 | | 21.6 | | | | |
| " | 16 | 5:15 P | 62 | | | 20.5 | | 19.9 | 17.9 | | | 17.7 | | 20.6 | | | | |
| " | 16 | 10:00 P | 56 | | | 9.3 | -8.6 | 34.4 | 33.9 | -7.1 | | 25.7 | -5.9 | 14.6 | -0.9 | | | |
| " | 17 | 7:00 A | 54 | | | | | | | | | | | | | | | |
| " | 17 | 9:45 A | 56 | 14.9 | | | | | | | | | | | | | | |
| " | 17 | 3:00 P | 64 | 15.2 | | | | | | | | | | | | | | |
| " | 17 | 4:30 P | 63 | 1.2 | 0.3 | | | | | | | | | | | | | |
| " | 17 | 10:30 P | 55 | | | | | | | | | | | | | | | |
| " | 18 | 12:15 A | 50 | | -1.2 | 0.2 | -5.1 | 13.9 | 14.4 | -2.1 | | 11.5 | -2.4 | 14.6 | 6.0 | | | |
| Toledo, O. | 18 | 9:15 A | 50 | -3.6 | 0.2 | 0.2 | -1.7 | 12.2 | 12.3 | 1.8 | | 9.8 | 1.1 | 19.0 | 3.3 | | | |
| Cleveland, O. | 18 | 4:45 P | 60 | -3.1 | 0.8 | 0.4 | 0.3 | 12.2 | 12.5 | 3.6 | | 16.2 | 3.5 | 19.6 | 6.3 | | | |
| Buffalo, N.Y. | 19 | 1:30 P | 50 | -1.4 | 1.5 | 2.3 | 2.5 | 13.2 | 13.4 | 5.9 | | 18.3 | 7.4 | 20.4 | 10.6 | | | |
| Syracuse, N.Y. | 19 | 11:15 A | 67 | -1.2 | 1.8 | 1.7 | 2.9 | 11.2 | 11.7 | 6.3 | | 18.4 | 9.1 | 20.8 | 12.6 | | | |
| Selkirk, N.Y. | 19 | 9:00 P | 53 | 0.0 | 3.6 | 3.4 | 4.4 | 16.2 | 8.8 | 8.3 | | 20.5 | 12.1 | 23.6 | 15.2 | | | |
| New York City | 20 | 10:00 A | 66 | 0.0 | 2.9 | 2.6 | 4.7 | 14.4 | 8.5 | 7.7 | | 19.6 | 13.2 | 22.6 | 16.3 | | | |
| " | 20 | 5:00 P | 71 | 0.7 | 3.0 | 3.4 | 5.0 | 15.9 | 9.3 | 8.4 | | 19.9 | 14.2 | 22.8 | 16.9 | | | |
| " | 21 | 11:00 A | 70 | 0.7 | 3.8 | 3.7 | 5.4 | 16.9 | 9.5 | 8.4 | | 20.7 | 15.6 | 23.1 | 18.1 | | | |
| " | 21 | 6:15 P | 68 | 1.1 | 6.0 | 6.2 | 7.9 | 21.5 | 11.4 | 10.4 | | 21.6 | 17.3 | 24.7 | 19.2 | | | |
| " | 22 | 10:00 A | 66 | 2.0 | 5.8 | 7.1 | 8.2 | 18.9 | 11.7 | 10.7 | | 22.1 | 19.0 | 25.1 | 19.6 | | | |
| " | 23 | 6:30 P | 70 | 2.7 | 6.3 | 5.2 | 8.4 | 20.9 | 12.5 | 10.9 | | 22.7 | 19.1 | 25.6 | 20.1 | | | |
| " | 23 | 11:00 A | 78 | 3.2 | 6.8 | 6.2 | 8.9 | 21.4 | 13.0 | 11.4 | | 23.2 | 19.6 | 25.6 | 20.1 | | | |
| " | 23 | 4:00 P | 84 | 3.4 | 7.3 | 7.2 | 9.9 | 24.9 | 14.0 | 12.4 | | 24.2 | 20.6 | 27.6 | 21.1 | | | |
| " | 24 | 11:00 A | 65 | 3.2 | 7.0 | 6.3 | 9.9 | 20.0 | 14.3 | 12.2 | | 25.2 | 20.9 | 24.9 | 20.3 | | | |
| " | 24 | 6:00 P | 64 | 3.7 | 7.6 | 7.0 | 10.3 | 21.7 | 14.6 | 12.6 | | 25.1 | 20.0 | 24.7 | 20.5 | | | |
| " | 25 | 7:45 A | 52 | 3.6 | 7.4 | 6.6 | 10.3 | 19.5 | 14.6 | 12.8 | | 25.4 | 21.2 | 23.5 | 20.4 | | | |
| " | 25 | 4:00 P | 50 | 3.7 | 7.2 | 6.8 | 10.3 | 20.4 | 14.6 | 12.8 | | 25.2 | 21.2 | 22.7 | 19.7 | | | |
| " | 26 | 8:15 A | 60 | 2.8 | 6.8 | 7.1 | 9.8 | 18.4 | 14.4 | 12.2 | | 25.2 | 21.0 | 21.6 | 19.1 | | | |
| " | 26 | 3:00 P | 67 | 3.6 | 7.5 | 7.3 | 10.0 | 19.3 | 14.6 | 12.8 | | 25.1 | 21.1 | 21.4 | 19.0 | | | |
| " | 27 | 8:00 A | 56 | 3.6 | 7.0 | 6.4 | 10.4 | 19.4 | 14.5 | 12.4 | | 24.2 | 20.6 | 22.4 | 18.6 | | | |
| " | 27 | 4:00 P | 74 | 3.7 | 7.0 | 6.4 | 10.1 | 21.2 | 14.7 | 12.4 | | 24.3 | 20.8 | 22.6 | 18.6 | | | |
| " | 28 | 7:30 A | 56 | 4.3 | 7.6 | 7.7 | 11.0 | 21.8 | 15.4 | 13.0 | | 25.3 | 21.5 | 25.7 | 19.3 | | | |

Note: In Car MDT 8037, all thermometers were located about 18" below ceiling during car pre-cooling period before loading

AIR AND COMMODITY TEMPERATURES RECORDED FROM DAILY READINGS

FROZEN MEATS FROM CHICAGO, ILL., TO NEW YORK CITY, N. Y.

CAR FGE 38088

| PLACE | DATE SEPT. 1943 | TIME | OUT- SIDE TEMP. | BUNKER | | | | QUARTER LENGTH | | | | DOORWAY | | | |
|----------------|-----------------------|---------|-----------------------|---------------------|----------------------|--------------------|---------------------|---------------------|----------------------|--------------------|---------------------|---------------------|----------------------|--------------------|---------------------|
| | | | | AIR BOT. C.L. | COM. BOT. SIDE | AIR TOP SIDE | COM. TOP SIDE | AIR BOT. C.L. | COM. BOT. SIDE | AIR TOP SIDE | COM. TOP SIDE | AIR BOT. SIDE | COM. BOT. SIDE | AIR TOP SIDE | COM. TOP SIDE |
| | | | | 1/ | 2/ | 3/ | 4/ | 5/ | 6/ | 7/ | 8/ | 9/ | 10/ | 11/ | 12/ |
| Chicago | 16 | 2:00 P | 59 | 59.6 | | 59.2 | | 59.5 | 59.3 | | | 59.8 | | 59.5 | |
| " | 16 | 5:15 P | 62 | 34.5 | | 31.0 | | 42.0 | 40.5 | | | 41.0 | | 38.0 | |
| " | 16 | 10:00 P | 56 | 16.0 | | 17.0 | | 26.5 | 25.5 | | | 26.0 | | 25.5 | |
| " | 17 | 1:00 P | 60 | 11.0 | | 11.5 | | 19.0 | 18.5 | | | 21.5 | | 15.0 | |
| " | 17 | 3:10 P | 64 | 8.0 | 3.0 | 9.5 | 25.5 | 43.0 | 20.0 | 42.5 | 3.5 | 42.5 | 16.5 | 20.0 | 10.0 |
| " | 17 | 6:00 P | 55 | 3.0 | 0.0 | 2.5 | 8.5 | 19.2 | 11.0 | 18.3 | -0.5 | 16.7 | 10.1 | 7.5 | 1.8 |
| Toledo, O. | 18 | 10:15 A | 50 | 0.8 | -0.1 | 1.2 | 6.1 | 13.7 | 9.8 | 13.5 | 0.1 | 13.0 | 8.5 | 9.3 | 2.0 |
| Cleveland, O | 18 | 4:30 P | 60 | 0.1 | 0.0 | 1.5 | 8.3 | 17.0 | 12.2 | 17.9 | -0.8 | 14.6 | 10.4 | 9.8 | 3.3 |
| Buffalo, N. Y. | 19 | 1:30 A | 50 | 0.4 | 1.6 | 2.1 | 8.5 | 16.4 | 12.5 | 15.8 | 0.6 | 13.7 | 10.9 | 10.9 | 5.0 |
| Syracuse, N.Y. | 19 | 11:15 A | 67 | 0.0 | 0.6 | 1.0 | 7.7 | 13.5 | 11.3 | 13.6 | 0.1 | 12.5 | 10.3 | 10.6 | 5.0 |
| Selkirk, N.Y. | 19 | 9:00 P | 53 | 0.3 | 3.6 | 2.8 | 11.8 | - | 15.4 | 19.8 | 1.8 | 17.7 | 13.6 | 14.1 | 7.7 |
| New York City | 20 | 10:00 A | 66 | 1.0 | 0.5 | 1.6 | 9.5 | 16.8 | 13.4 | 15.6 | 1.2 | 14.1 | 14.1 | 10.9 | 6.8 |
| " | 20 | 5:00 P | 71 | 1.3 | 2.4 | 3.2 | 13.3 | 21.4 | 16.8 | 20.9 | 3.5 | 18.1 | 15.0 | 15.5 | 8.3 |
| " | 21 | 11:00 A | 70 | 1.7 | 2.0 | 3.0 | 14.0 | 22.0 | 18.0 | 22.0 | 3.5 | 19.0 | 15.5 | 18.0 | 9.0 |
| " | 21 | 6:10 P | 68 | 1.6 | 3.6 | 4.0 | 17.5 | 27.7 | 21.5 | 27.6 | 6.4 | 23.2 | 19.0 | 14.9 | 11.4 |
| " | 22 | 10:00 A | 66 | 2.7 | 3.6 | 4.7 | 15.5 | 21.6 | 19.8 | 21.5 | 6.5 | 19.8 | 17.3 | 14.6 | 11.4 |
| " | 22 | 6:30 P | 70 | 3.7 | 4.5 | 5.0 | 18.5 | 27.5 | 22.5 | 26.5 | 7.5 | 23.0 | 20.0 | 16.0 | 12.0 |
| " | 23 | 11:00 A | 78 | 3.0 | 4.0 | 4.5 | 18.5 | 26.5 | 22.5 | 26.5 | 7.5 | 22.5 | 20.0 | 16.0 | 12.0 |
| " | 23 | 4:00 P | 84 | 3.7 | 4.0 | 4.5 | 20.2 | 32.0 | 24.5 | 32.0 | 7.8 | 27.0 | 21.5 | 17.0 | 12.5 |
| " | 24 | 11:00 A | 65 | 3.6 | 4.0 | 4.5 | 16.5 | 21.6 | 21.0 | 21.5 | 7.5 | 20.0 | 19.2 | 14.9 | 11.5 |
| " | 24 | 6:00 P | 64 | 3.7 | 4.0 | 4.0 | 17.5 | 23.5 | 21.8 | 23.5 | 7.7 | 21.4 | 17.0 | 14.6 | 11.7 |
| " | 25 | 7:45 A | 52 | 3.1 | 3.4 | 3.6 | 15.4 | 19.3 | 19.1 | 18.9 | 7.4 | 17.8 | 18.0 | 14.0 | 10.7 |
| " | 25 | 4:00 P | 60 | 3.4 | 3.7 | 3.7 | 16.6 | 21.3 | 20.2 | 21.3 | 7.5 | 19.9 | 18.6 | 13.8 | 10.4 |
| " | 26 | 8:15 A | 50 | 3.0 | 3.0 | 3.1 | 15.5 | 18.8 | 18.6 | 18.6 | 7.1 | 16.9 | 17.3 | 13.6 | 10.1 |
| " | 26 | 3:00 P | 67 | 3.1 | 3.2 | 3.9 | 16.3 | 20.7 | 20.0 | 20.9 | 7.1 | 19.6 | 18.2 | 13.2 | 10.3 |
| " | 27 | 8:00 A | 56 | 2.9 | 3.8 | 3.8 | 15.5 | 18.7 | 20.3 | 18.5 | 8.8 | 17.0 | 17.5 | 13.7 | 10.0 |
| " | 27 | 4:00 P | 74 | 3.5 | 4.0 | 4.9 | 17.5 | 23.0 | 21.5 | 23.0 | 7.5 | 21.0 | 19.5 | 16.4 | 10.6 |
| " | 28 | 7:30 A | 56 | 3.0 | 3.5 | 3.5 | 17.1 | 21.7 | 20.1 | 21.5 | 7.0 | 19.5 | 18.8 | 14.7 | 10.5 |

AIR AND COMMODITY TEMPERATURES RECORDED FROM DAILY READINGS

FROZEN MEATS FROM CHICAGO, ILL., TO NEW YORK CITY, N. Y.

CAR FGE 36713

| PLACE | DATE SEPT. 1943 | TIME | OUT- SIDE TEMP. | BUNKER | | | | QUARTER LENGTH | | | | DOORWAY | | | |
|----------------|-----------------------|---------|-----------------------|-------------|--------------|-------------|--------------|----------------|--------------|-------------|--------------|------------|-------------|-------------|--------------|
| | | | | AIR BOT. | COM. BOT. | AIR TOP. | COM. TOP. | AIR C.L. | COM. C.L. | AIR SIDE | COM. SIDE | AIR TOP | COM. TOP | AIR SIDE | COM. SIDE |
| | | | | 1/2 | 3/4 | 5/8 | 6/8 | 7/8 | 8/8 | 9/8 | 10/8 | 11/8 | 12/8 | 13/8 | 14/8 |
| Chicago | 16 | 2:00 P | 59 | 63.7 | 58.2 | 59.5 | 59.0 | 59.7 | 58.8 | | | | | | |
| " | 16 | 5:15 P | 62 | 35.8 | 39.7 | 50.5 | 49.9 | 51.0 | 47.4 | | | | | | |
| " | 16 | 6:45 P | 54 | 36.8 | 26.3 | 40.3 | 38.7 | 39.6 | 35.6 | | | | | | |
| " | 16 | 10:00 P | 56 | 23.8 | 21.2 | 33.5 | 31.9 | 33.0 | 27.9 | | | | | | |
| " | 17 | 7:00 A | 54 | 15.0 | 15.0 | 23.6 | 22.3 | 23.1 | 18.7 | | | | | | |
| " | 17 | 6:00 P | 57 | 14.3 | 2.3 | 23.0 | 21.9 | 23.0 | 9.9 | | | | | | |
| " | 17 | 10:30 P | 55 | - | 1.3 | 22.0 | 20.9 | 21.5 | 9.9 | | | | | | |
| " | 18 | 9:15 A | 50 | 3.6 | 2.0 | 17.5 | 16.6 | 16.7 | 5.1 | | | | | | |
| Toledo, O. | 18 | 4:30 P | 60 | 3.3 | 3.7 | 19.5 | 18.5 | 19.5 | 7.4 | | | | | | |
| Cleveland, O. | 19 | 1:30 A | 50 | - | 4.3 | 18.9 | 17.5 | 18.0 | 8.9 | | | | | | |
| Buffalo, N.Y. | 19 | 11:15 A | 67 | 6.8 | 3.4 | 15.8 | 15.0 | 15.9 | 8.6 | | | | | | |
| Syracuse, N.Y. | 19 | 9:00 P | 53 | 6.3 | 5.2 | 23.4 | 22.4 | 22.5 | 11.7 | | | | | | |
| Selkirk, N.Y. | 20 | 10:00 A | 66 | 4.8 | 4.1 | 20.0 | 19.3 | 19.8 | 11.0 | | | | | | |
| New York City | 20 | 5:00 P | 71 | 6.3 | 4.4 | 23.5 | 22.7 | 23.2 | 11.9 | | | | | | |
| " | 20 | 11:00 A | 70 | 5.8 | 4.3 | 25.0 | 24.4 | 24.5 | 11.4 | | | | | | |
| " | 21 | 6:10 P | 68 | 5.7 | 5.7 | 31.4 | 29.9 | 30.2 | 13.4 | | | | | | |
| " | 22 | 10:00 A | 66 | 7.6 | 7.3 | 26.0 | 25.7 | 25.9 | 15.1 | | | | | | |
| " | 22 | 6:30 P | 70 | 9.3 | 7.8 | 30.5 | 29.4 | 30.0 | 15.2 | | | | | | |
| " | 23 | 11:00 A | 78 | 9.8 | 8.8 | 31.0 | 30.4 | 30.4 | 15.7 | | | | | | |
| " | 23 | 4:00 P | 84 | 10.3 | 8.8 | 35.0 | 34.4 | 34.5 | 16.2 | | | | | | |
| " | 24 | 11:00 A | 65 | 10.6 | 8.8 | 27.5 | 26.9 | 27.2 | 14.9 | | | | | | |
| " | 24 | 6:00 P | 64 | 10.9 | 9.3 | 29.9 | 29.3 | 30.0 | 15.1 | | | | | | |
| " | 25 | 7:45 A | 52 | 10.7 | 9.3 | 26.4 | 25.7 | 26.0 | 14.8 | | | | | | |
| " | 25 | 4:00 P | 60 | 10.5 | 9.4 | 28.0 | 27.3 | 28.1 | 14.7 | | | | | | |
| " | 26 | 8:15 A | 50 | 10.3 | 9.3 | 25.6 | 24.9 | 25.3 | 14.4 | | | | | | |
| " | 26 | 3:00 P | 67 | 10.4 | 9.3 | 26.9 | 26.1 | 26.8 | 14.3 | | | | | | |
| " | 27 | 8:00 A | 56 | 9.3 | 9.2 | 26.0 | 25.4 | 25.9 | 14.3 | | | | | | |
| " | 27 | 4:00 P | 74 | 10.0 | 9.5 | 29.0 | 28.7 | 29.5 | 14.9 | | | | | | |
| " | 28 | 7:30 A | 56 | 9.4 | 9.5 | 27.7 | 27.8 | 28.4 | 14.8 | | | | | | |

AIR AND COMMODITY TEMPERATURES RECORDED FROM DAILY READINGS

FROZEN MEATS FROM CHICAGO, ILL., TO NEW YORK CITY, N. Y.

CAR FGE 38170

| PLACE | DATE SEPT. 1943 | TIME | OUT- SIDE TEMP. | BUNKER | | | | QUARTER LENGTH | | | | DOORWAY | | | |
|----------------|-----------------------|---------|-----------------------|-------------|--------------|-------------|--------------|----------------|-------------|-------------|--------------|------------|-------------|-------------|--------------|
| | | | | AIR BOT. | COM. BOT. | AIR SIDE | COM. SIDE | AIR TOP | COM. TOP | AIR C.L. | COM. SIDE | AIR TOP | COM. TOP | AIR SIDE | COM. SIDE |
| | | | | 1/ | 2/ | 3/ | 4/ | 5/ | 6/ | 7/ | 8/ | 9/ | 10/ | 11/ | 12/ |
| Chicago | 16 | 2:00 P | 59 | 59.0 | | 59.3 | | 60.0 | | 59.9 | | 59.7 | | 59.2 | |
| " | 16 | 5:15 P | 62 | 25.0 | | 33.0 | | 43.0 | | 43.0 | | 42.5 | | 37.5 | |
| " | 16 | 6:45 P | 54 | 25.0 | | 27.3 | | 34.4 | | 35.4 | | 34.4 | | 30.3 | |
| " | 16 | 10:00 P | 56 | 15.0 | | 22.0 | | 28.0 | | 28.0 | | 28.5 | | 24.0 | |
| " | 17 | 7:00 A | 54 | 10.8 | | 14.8 | | 20.0 | | 20.0 | | 20.0 | | 17.0 | |
| " | 17 | 6:00 P | 57 | 2.0 | -0.5 | 2.5 | 6.5 | 19.5 | 9.5 | 18.0 | 3.5 | 19.0 | 6.5 | 5.0 | 3.0 |
| " | 17 | 10:30 P | 54 | 2.0 | -0.5 | 2.3 | 6.6 | 17.2 | 8.5 | 17.0 | 4.0 | 17.5 | 5.0 | 5.0 | 4.0 |
| Toledo, Ohio | 18 | 9:15 A | 51 | 0.7 | -0.2 | 2.0 | 8.0 | 15.0 | 8.5 | 14.8 | 4.4 | 14.8 | 6.0 | 5.0 | 4.6 |
| Cleveland, O. | 18 | 4:45 P | 60 | 1.2 | -0.6 | 3.0 | 8.7 | 18.0 | 10.6 | 17.0 | 6.4 | 18.0 | 6.6 | 6.0 | 5.2 |
| Buffalo, N.Y. | 19 | 1:30 A | 50 | 2.0 | 1.7 | 3.6 | 9.0 | 15.5 | 10.8 | 15.3 | 6.8 | 16.0 | 7.7 | 7.0 | 6.4 |
| Syracuse, N.Y. | 19 | 11:15 A | 67 | 1.1 | 1.4 | 3.8 | 8.7 | 14.0 | 10.5 | 13.8 | 6.8 | 14.5 | 7.6 | 6.5 | 6.1 |
| Selkirk, N.Y. | 19 | 8:45 P | 53 | 2.1 | 2.5 | 4.8 | 12.0 | - | 13.4 | 19.9 | 8.3 | 20.7 | 10.7 | 11.8 | 7.9 |
| New York City | 20 | 10:00 A | 66 | 2.0 | 3.0 | 4.3 | 11.9 | 17.1 | 12.7 | 17.3 | 8.5 | 17.8 | 9.4 | 10.8 | 8.0 |
| " | 20 | 5:00 P | 71 | 2.7 | 3.1 | 5.2 | 13.5 | 21.5 | 14.5 | 21.0 | 10.0 | 21.5 | 10.0 | 12.5 | 9.0 |
| " | 20 | 11:00 A | 70 | 3.0 | 3.5 | 4.5 | 15.5 | 23.5 | 15.0 | 23.5 | 10.0 | 23.0 | 10.5 | 11.0 | 9.0 |
| " | 21 | 6:10 P | 68 | 3.3 | 4.8 | 6.1 | 18.0 | 28.2 | 17.8 | 27.1 | 11.4 | 28.0 | 11.9 | 13.0 | 10.5 |
| " | 22 | 10:00 A | 66 | 4.2 | 5.8 | 7.0 | 15.4 | 21.5 | 16.4 | 21.3 | 12.1 | 21.6 | 12.3 | 13.0 | 11.2 |
| " | 22 | 6:30 P | 70 | 4.5 | 6.0 | 7.5 | 17.5 | 25.5 | 18.0 | 25.0 | 12.5 | 25.0 | 12.5 | 14.0 | 11.5 |
| " | 23 | 11:00 A | 78 | 4.5 | 7.0 | 7.0 | 19.5 | 27.5 | 19.5 | 27.0 | 13.0 | 27.0 | 13.0 | 14.0 | 12.0 |
| " | 23 | 4:00 P | 84 | 5.0 | 7.0 | 8.0 | 21.0 | 32.0 | 21.0 | 31.5 | 14.0 | 32.0 | 13.5 | 14.5 | 12.5 |
| " | 24 | 11:00 A | 65 | 4.2 | 6.3 | 7.0 | 17.0 | 22.2 | 17.0 | 22.1 | 12.3 | 22.1 | 12.5 | 13.0 | 12.1 |
| " | 24 | 6:00 P | 64 | 4.9 | 7.1 | 7.5 | 18.1 | 23.8 | 17.6 | 23.6 | 13.6 | 23.9 | 12.6 | 12.4 | 12.4 |
| " | 25 | 7:45 A | 52 | 4.1 | 7.0 | 7.3 | 16.7 | 20.2 | 16.4 | 20.0 | 13.3 | 20.3 | 11.6 | 11.2 | 12.2 |
| " | 25 | 4:00 P | 60 | 4.1 | 7.0 | 7.1 | 17.6 | 22.9 | 16.8 | 22.6 | 13.1 | 22.6 | 14.9 | 10.9 | 11.9 |
| " | 26 | 8:15 A | 50 | 3.9 | 6.9 | 7.2 | 15.5 | 18.9 | 15.5 | 18.9 | 13.0 | 19.1 | 11.4 | 10.2 | 11.9 |
| " | 26 | 3:00 P | 67 | 4.5 | 7.4 | 7.1 | 16.8 | 21.7 | 16.5 | 21.9 | 13.0 | 21.7 | 10.9 | 10.4 | 11.9 |
| " | 27 | 8:00 A | 56 | 3.0 | 6.0 | 6.2 | 15.6 | 19.0 | 15.3 | 19.0 | 12.2 | 19.4 | 9.7 | 9.7 | 10.9 |
| " 60th St | 27 | 4:00 P | 74 | 3.4 | 6.5 | 7.2 | 17.5 | 23.2 | 17.5 | 23.0 | 13.8 | 23.4 | 10.8 | 11.2 | 11.5 |
| " | 28 | 7:30 A | 56 | 2.9 | 5.6 | 6.0 | 16.6 | 21.9 | 15.8 | 21.4 | 12.5 | 21.6 | 10.0 | 10.0 | 11.2 |

AIR AND COMMODITY TEMPERATURES RECORDED FROM DAILY READINGS

FROZEN MEATS FROM CHICAGO, ILL., TO NEW YORK CITY, N. Y.

CAR SRIK 2327

| PLACE | DATE SEPT. 1943 | TIME | OUT- SIDE TEMP. | -----BUNKER----- | | | | QUARTER LENGTH | | | | -----DOCKWAY----- | | | |
|----------------|-----------------------|---------|-----------------------|------------------|--------------|------------|-------------|----------------|--------------|------------|-------------|-------------------|--------------|------------|-------------|
| | | | | AIR BOT. | COM. BOT. | AIR TOP | COM. TOP | AIR BOT. | COM. BOT. | AIR TOP | COM. TOP | AIR BOT. | COM. BOT. | AIR TOP | COM. TOP |
| | | | | 1/ | 2/ | 3/ | 4/ | 5/ | 6/ | 7/ | 8/ | 9/ | 10/ | 11/ | 12/ |
| Chicago | 16 | 8:00 A | 58 | 61.0 | 61.6 | 62.7 | 62.7 | 62.6 | 61.5 | 61.9 | 61.9 | 61.5 | 61.9 | 61.9 | 61.9 |
| " | 16 | 6:00 P | 54 | 35.4 | 22.3 | 30.1 | 30.1 | 31.3 | 30.0 | 24.6 | 24.6 | 30.0 | 24.6 | 24.6 | 24.6 |
| " | 17 | 7:30 A | 55 | 12.0 | 15.1 | 22.2 | 22.2 | 23.1 | 21.5 | 18.9 | 18.9 | 21.5 | 18.9 | 18.9 | 18.9 |
| " | 17 | 6:00 P | 57 | 3.0 | 22.2 | 6.1 | 22.1 | 17.2 | 3.5 | 17.6 | 20.1 | 19.0 | 6.9 | 6.9 | -0.9 |
| " | 17 | 10:30 P | 55 | 0.5 | 20.8 | 5.2 | 22.1 | 15.0 | 4.3 | 14.9 | 18.5 | 16.0 | -0.2 | 8.1 | -0.8 |
| Toledo, Ohio | 18 | 9:15 A | 50 | 1.3 | 15.8 | 5.4 | 19.0 | 14.1 | 6.6 | 14.9 | 15.7 | 15.1 | 2.5 | 8.1 | -2.6 |
| Cleveland, O. | 18 | 4:45 P | 60 | 1.4 | 13.1 | 3.3 | 17.1 | 14.6 | 8.1 | 15.4 | 15.1 | 16.1 | 4.0 | 9.3 | 3.2 |
| Buffalo, N. Y. | 19 | 1:00 A | 50 | 1.4 | 10.6 | 5.3 | 15.3 | 14.7 | 9.7 | 15.5 | 13.5 | 15.8 | 5.1 | 9.8 | 4.4 |
| Syracuse, N.Y. | 19 | 11:15 A | 67 | 1.5 | 8.7 | 3.9 | 13.3 | 13.4 | 9.6 | 14.2 | 11.8 | 14.3 | 6.0 | 9.4 | 5.1 |
| Selkirk, N.Y. | 19 | 8:45 P | 53 | 2.0 | 7.7 | 5.2 | 12.5 | 16.6 | 11.4 | 16.3 | 11.6 | 17.8 | 7.9 | 12.6 | 6.7 |
| New York City | 20 | 10:00 A | 66 | 3.2 | 7.1 | 5.5 | 12.1 | 15.4 | 12.0 | 16.1 | 10.8 | 16.3 | 8.6 | 11.2 | 7.8 |
| " | 20 | 5:00 P | 71 | 3.7 | 7.2 | 6.3 | 12.3 | 16.7 | 13.0 | 17.5 | 10.8 | 17.9 | 9.4 | 12.2 | 8.9 |
| " | 21 | 11:00 A | 70 | 4.5 | 7.2 | 8.1 | 12.6 | 18.7 | 14.5 | 19.6 | 11.1 | 20.0 | 10.7 | 13.9 | 10.6 |
| " | 21 | 6:15 P | 68 | 4.5 | 8.7 | 8.6 | 13.7 | 21.1 | 16.6 | 21.8 | 12.1 | 23.3 | 12.1 | 15.4 | 12.1 |
| " | 22 | 10:00 A | 66 | 6.2 | 9.2 | 9.8 | 14.3 | 20.6 | 17.0 | 21.0 | 13.1 | 21.5 | 13.2 | 16.3 | 13.4 |
| " | 22 | 6:30 P | 70 | 7.5 | 9.7 | 11.1 | 14.1 | 20.7 | 17.0 | 21.1 | 13.1 | 22.0 | 13.7 | 16.4 | 13.6 |
| " | 23 | 11:00 A | 78 | 8.0 | 10.7 | 12.1 | 15.1 | 21.7 | 18.5 | 22.6 | 14.1 | 23.0 | 14.7 | 17.4 | 14.6 |
| " | 23 | 4:00 P | 84 | 7.8 | 11.2 | 11.1 | 16.1 | 24.7 | 19.5 | 24.6 | 14.6 | 26.0 | 15.4 | 18.4 | 15.6 |
| " | 24 | 11:00 A | 65 | 7.6 | 10.9 | 10.4 | 16.2 | 21.7 | 19.4 | 22.1 | 14.5 | 22.7 | 15.9 | 17.4 | 16.0 |
| " | 24 | 6:00 P | 64 | 7.1 | 11.3 | 9.6 | 16.5 | 22.1 | 19.9 | 23.0 | 14.6 | 23.5 | 16.4 | 17.4 | 16.2 |
| " | 25 | 7:45 A | 52 | 7.4 | 10.8 | 10.0 | 16.4 | 21.5 | 19.6 | 22.0 | 14.2 | 22.2 | 16.5 | 17.3 | 16.1 |
| " | 25 | 4:00 P | 60 | 7.9 | 11.0 | 10.8 | 16.5 | 22.5 | 20.0 | 22.8 | 14.4 | 23.5 | 16.7 | 17.4 | 16.3 |
| " | 26 | 8:15 A | 50 | 7.8 | 10.7 | 9.5 | 16.4 | 21.3 | 20.0 | 22.0 | 14.1 | 21.9 | 16.8 | 17.0 | 16.4 |
| " | 26 | 3:00 P | 67 | 8.3 | 10.9 | 10.4 | 16.9 | 21.8 | 20.1 | 22.5 | 14.2 | 22.6 | 17.1 | 17.4 | 16.8 |
| " | 27 | 8:00 A | 56 | 7.4 | 10.3 | 9.4 | 17.1 | 22.1 | 20.4 | 22.1 | 14.0 | 22.5 | 17.3 | 16.9 | 16.6 |
| " | 27 | 4:00 P | 74 | 6.9 | 10.5 | 8.1 | 17.1 | 22.5 | 20.5 | 22.8 | 13.9 | 23.1 | 17.2 | 17.4 | 16.9 |
| " | 28 | 7:30 A | 56 | 8.0 | 10.7 | 10.4 | 17.3 | 23.7 | 20.8 | 23.6 | 14.1 | 23.7 | 17.9 | 18.4 | 17.6 |

AIR AND COMMODITY TEMPERATURES RECORDED FROM DAILY READINGS

FROZEN MEATS FROM CHICAGO, ILL., TO NEW YORK CITY, N. Y.

CAR SRLX 2483

| PLACE | DATE SEPT. 1943 | TIME | OUT- SIDE TEMP. | BUNKER | | | | QUARTER LENGTH | | | | DOORWAY | | | |
|----------------|-----------------------|---------|-----------------------|-------------|--------------|-------------|--------------|----------------|-------------|-------------|--------------|------------|-------------|-------------|--------------|
| | | | | AIR BOT. | COM. BOT. | AIR SIDE | COM. SIDE | AIR TOP | COM. TOP | AIR C.L. | COM. SIDE | AIR TOP | COM. TOP | AIR SIDE | COM. SIDE |
| | | | | 1/ | 2/ | 3/ | 4/ | 5/ | 6/ | 7/ | 8/ | 9/ | 10/ | 11/ | 12/ |
| Chicago | 16 | 8:00 A | 58 | 61.8 | 61.5 | 62.8 | 62.5 | 62.5 | 62.5 | 62.5 | 62.5 | 61.0 | 60.5 | 60.5 | -3.0 |
| " | 16 | 6:00 P | 54 | - | 21.8 | 26.7 | 28.2 | 28.2 | 28.2 | 28.2 | 28.2 | 27.0 | 22.8 | 22.8 | -0.5 |
| " | 17 | 7:30 A | 55 | 13.3 | 16.5 | 18.3 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 19.5 | 17.0 | 17.0 | 1.3 |
| " | 17 | 2:00 P | | 6.8 | 11.0 | 24.3 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 23.5 | -2.4 | - | -3.0 |
| " | 17 | 6:00 P | 57 | 2.3 | 4.5 | 15.8 | 15.5 | 15.5 | 15.5 | 15.5 | 15.5 | 15.5 | 0.1 | - | -0.5 |
| " | 17 | 10:30 P | 55 | 2.6 | 4.7 | 14.1 | 13.5 | 13.5 | 13.5 | 13.5 | 13.5 | 14.0 | 2.1 | - | 1.3 |
| Toledo, Ohio | 18 | 9:15 A | 50 | 1.3 | 5.0 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 11.3 | 3.2 | - | 1.6 |
| Cleveland, O. | 18 | 4:45 P | 60 | 1.3 | 0.2 | 12.1 | 11.6 | 11.6 | 11.6 | 11.6 | 11.6 | 12.1 | 4.3 | - | 2.5 |
| Buffalo, N. Y. | 19 | 1:00 A | 50 | 2.1 | 1.4 | 12.7 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.7 | 5.6 | - | 3.7 |
| Syracuse, N.Y. | 19 | 11:15 A | 67 | 2.1 | 2.2 | 11.2 | 11.2 | 11.2 | 11.2 | 11.2 | 11.2 | 11.2 | 6.4 | - | 4.5 |
| Selkirk, N.Y. | 19 | 8:45 P | 53 | 3.0 | 3.2 | 14.8 | 14.7 | 14.7 | 14.7 | 14.7 | 14.7 | 15.1 | 7.8 | - | 4.9 |
| New York City | 20 | 10:00 A | 66 | 3.7 | 4.6 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.4 | 9.5 | - | 7.4 |
| " | 20 | 5:00 P | 71 | 4.6 | 5.5 | 15.9 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.9 | 10.1 | - | 8.1 |
| " | 21 | 11:00 A | 70 | 5.3 | 5.7 | 18.3 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 11.6 | - | 10.0 |
| " | 21 | 6:15 P | 68 | 4.7 | 7.8 | 21.2 | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | 21.1 | 13.5 | - | 11.4 |
| " | 22 | 10:00 A | 66 | 6.1 | 8.3 | 19.8 | 19.6 | 19.6 | 19.6 | 19.6 | 19.6 | 19.8 | 14.1 | - | 12.5 |
| " | 22 | 6:30 P | 70 | 6.8 | 9.2 | 21.3 | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | 14.6 | - | 13.0 |
| " | 23 | 11:00 A | 78 | 7.3 | 10.2 | 22.3 | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | 16.1 | - | 14.5 |
| " | 23 | 4:00 P | 84 | 5.8 | 10.2 | 24.4 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.0 | 16.6 | - | 14.8 |
| " | 24 | 11:00 A | 65 | 6.6 | 10.7 | 21.9 | 21.9 | 21.9 | 21.9 | 21.9 | 21.9 | 22.0 | 17.4 | - | 15.5 |
| " | 24 | 6:00 P | 64 | 5.8 | 10.7 | 21.9 | 22.3 | 22.3 | 22.3 | 22.3 | 22.3 | 22.1 | 17.7 | - | 15.7 |
| " | 25 | 7:45 A | 52 | 5.8 | 10.7 | 21.1 | 21.1 | 21.1 | 21.1 | 21.1 | 21.1 | 21.0 | 17.9 | - | 15.9 |
| " | 25 | 4:00 P | 60 | 5.7 | 11.0 | 21.5 | 21.6 | 21.6 | 21.6 | 21.6 | 21.6 | 21.5 | 19.0 | - | 16.4 |
| " | 26 | 8:15 A | 50 | 4.9 | 10.6 | 20.2 | 20.6 | 20.6 | 20.6 | 20.6 | 20.6 | 20.2 | 18.0 | - | 16.4 |
| " | 26 | 3:00 P | 67 | 5.3 | 10.8 | 20.8 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 21.0 | 18.2 | - | 16.6 |
| " | 27 | 8:00 A | 56 | 4.6 | 10.5 | 20.8 | 20.9 | 20.9 | 20.9 | 20.9 | 20.9 | 21.0 | 18.3 | - | 16.6 |
| " | 27 | 4:00 P | 74 | 4.0 | 10.1 | 21.8 | 21.6 | 21.6 | 21.6 | 21.6 | 21.6 | 21.8 | 18.6 | - | 17.3 |
| " | 28 | 7:30 A | 56 | 5.6 | 10.7 | 22.8 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 19.1 | - | 17.3 |

AIR AND COMMODITY TEMPERATURES RECORDED FROM DAILY READINGS

FROZEN MEATS FROM CHICAGO, ILL., TO NEW YORK CITY, N. Y.

CAR SRLX 3028

| PLACE | DATE SEPT 1943 | TIME | OUT- SIDE TEMP. | -----BUNKER----- | | | | QUARTER LENGTH | | | | -----DOORWAY----- | | | |
|----------------|----------------------|------------|-----------------------|------------------|--------------|------------|-------------|----------------|-----|--------------|-------------|-------------------|--------------|-------------|--------------|
| | | | | AIR BOT. | COM. BOT. | AIR TOP | COM. TOP | AIR C.L. | TOP | COM. BOT. | AIR SIDE | AIR TOP | COM. SIDE | AIR SIDE | COM. BOT. |
| | | | | 1/ | 2/ | 3/ | 4/ | 5/ | 6/ | 7/ | 8/ | 9/ | 10/ | 11/ | 12/ |
| Chicago | 16 | 8:00 A 58 | 57.5 | 57.8 | | 59.8 | | 59.6 | | | | 59.1 | | 57.0 | |
| " | 16 | 6:00 P 54 | 9.1 | 11.3 | | 22.5 | | 23.4 | | | | 24.3 | | 18.8 | |
| " | 17 | 7:30 A 55 | - | 9.3 | | 16.3 | | 18.1 | | | | 18.1 | | 14.5 | |
| " | 17 | 2:00 P | 3.5 | 4.8 | | 32.8 | | 33.6 | | | | - | | 4.0 | |
| " | 17 | 6:00 P 57 | -2.0 | 0.3 | | 21.3 | | 22.1 | | | | 22.6 | | 1.5 | |
| " | 17 | 10:30 P 55 | -1.1 | -0.7 | | 18.1 | | 19.5 | | | | 20.0 | | | |
| Chicago | 18 | 9:15 A 50 | -1.0 | -0.7 | | 15.3 | | 16.1 | | | | 18.8 | | 3.1 | |
| Cleveland, O. | 18 | 4:30 P 60 | -2.0 | -0.6 | | 16.5 | | 17.1 | | | | 18.3 | | 6.5 | |
| Buffalo, N.Y. | 19 | 1:00 A 50 | -2.2 | 0.0 | | 16.4 | | 17.2 | | | | 17.7 | | 7.6 | |
| Syracuse, N.Y. | 19 | 11:10 A 67 | -2.3 | 0.9 | | 14.5 | | 15.0 | | | | 15.3 | | 8.2 | |
| Selkirk, N.Y. | 19 | 8:45 P 53 | 0 | 2.3 | | 20.3 | | 20.2 | | | | 21.0 | | 12.8 | |
| New York City | 20 | 10:00 A 66 | -0.6 | 2.5 | | 17.8 | | 18.4 | | | | 19.1 | | 11.5 | |
| " | 20 | 5:00 P 71 | -1.5 | 3.8 | | 20.3 | | 20.7 | | | | 21.6 | | 15.5 | |
| " | 21 | 11:00 A 70 | -1.0 | 3.5 | | 21.9 | | 22.6 | | | | 23.1 | | 16.5 | |
| " | 21 | 6:15 P 68 | -0.7 | 4.6 | | 25.2 | | 25.1 | | | | 26.7 | | 17.5 | |
| " | 22 | 10:00 A 66 | 0.3 | 5.7 | | 24.6 | | 24.8 | | | | 26.0 | | 18.0 | |
| " | 22 | 6:30 P 70 | 1.5 | 7.0 | | 26.3 | | 26.6 | | | | 27.6 | | 20.0 | |
| " | 23 | 11:00 A 78 | 2.0 | 7.5 | | 27.3 | | 27.6 | | | | 28.1 | | 21.0 | |
| " | 23 | 4:00 P 84 | 2.5 | 8.0 | | 30.3 | | 30.1 | | | | 31.1 | | 21.0 | |
| " | 24 | 11:00 A 65 | 2.5 | 9.0 | | 26.4 | | 26.8 | | | | 27.5 | | 19.1 | |
| " | 24 | 6:00 P 64 | 2.9 | 9.0 | | 22.5 | | 22.2 | | | | 23.0 | | 19.6 | |
| " | 25 | 7:45 A 52 | 2.0 | 8.5 | | 25.6 | | 25.7 | | | | 26.4 | | 18.5 | |
| " | 25 | 4:00 P 60 | 2.3 | 8.6 | | 25.9 | | 26.6 | | | | 27.2 | | 19.5 | |
| " | 26 | 8:15 A 50 | 2.9 | 8.5 | | 23.9 | | 24.5 | | | | 25.0 | | 19.4 | |
| " | 26 | 3:00 P 67 | 3.9 | 9.5 | | 25.4 | | 25.7 | | | | 26.1 | | 20.3 | |
| " | 27 | 8:00 A 56 | 2.8 | 8.5 | | 23.8 | | 24.4 | | | | 25.3 | | 19.7 | |
| " 60 St. | 27 | 4:00 P 74 | 4.5 | 9.9 | | 26.8 | | 27.1 | | | | 28.1 | | 24.3 | |
| " | 28 | 7:30 A 56 | 4.5 | 10.0 | | 27.8 | | 28.1 | | | | 29.1 | | 23.0 | |

FROZEN MEATS FROM CHICAGO, ILL., TO NEW YORK CITY, N.Y.

CAR SRIX 4114

| PLACE | DATE SEPT. 1943 | TIME | OUT- SIDE TEMP. | BUNKER | | | | QUARTER LENGTH | | | | DOORWAY | | | |
|----------------|-----------------------|-------|-----------------------|---------------------|----------------------|---------------------|---------------------|--------------------|----------------------|--------------------|---------------------|---------------------|----------------------|------|--|
| | | | | AIR BOT. C.L. | COM. BOT. SIDE | AIR BOT. SIDE | COM. TOP SIDE | AIR TOP C.L. | COM. BOT. SIDE | AIR TOP SIDE | COM. TOP SIDE | AIR BOT. SIDE | COM. SIDE SIDE | | |
| Chicago | 16 | 8:00 | A 58 | 60.7 | 60.3 | 61.8 | 61.3 | 61.3 | 61.3 | 61.3 | 61.3 | 61.3 | 61.3 | 60.3 | |
| " | 16 | 6:00 | P 54 | 43.8 | 25.1 | 33.6 | 34.1 | 34.9 | 34.9 | 34.9 | 34.9 | 34.9 | 34.9 | 31.0 | |
| " | 17 | 7:30 | A 55 | 21.7 | 19.3 | 26.3 | 27.3 | 27.3 | 27.3 | 27.3 | 27.3 | 27.3 | 27.3 | 24.3 | |
| " | 17 | 2:00 | P 57 | 12.7 | 15.8 | 31.8 | -0.7 | 31.8 | -2.5 | 31.8 | -3.0 | 32.3 | 0.0 | 13.8 | |
| " | 17 | 6:00 | P 57 | 9.7 | 10.8 | 18.3 | 10.8 | 18.3 | -0.5 | 23.3 | -1.5 | 24.8 | 1.0 | 9.8 | |
| " | 17 | 10:30 | P 55 | 6.9 | 10.0 | 16.2 | 12.2 | 16.2 | 1.2 | 20.0 | -1.2 | 21.7 | 1.9 | 9.8 | |
| Toledo, O. | 18 | 9 15 | A 50 | 3.2 | 6.7 | 17.5 | 3.6 | 17.5 | 3.4 | 17.8 | -0.2 | 18.9 | 3.0 | 9.2 | |
| Cleveland, O. | 18 | 4:30 | P 60 | 2.9 | 5.1 | 17.6 | 4.7 | 17.6 | 4.8 | 17.5 | 0.6 | 19.3 | 4.0 | 11.6 | |
| Buffalo, N.Y. | 19 | 1:00 | A 50 | 2.0 | 4.0 | 18.3 | 5.1 | 18.3 | 5.3 | 18.0 | 1.1 | 19.6 | 5.2 | 11.9 | |
| Syracuse, N.Y. | 19 | 11:10 | A 67 | 2.2 | 4.0 | 16.4 | 5.8 | 16.4 | 6.1 | 16.0 | 1.5 | 17.5 | 5.5 | 10.6 | |
| Selkirk, N.Y. | 19 | 8:45 | P 53 | 2.5 | 2.6 | 6.8 | 6.8 | 19.3 | 7.2 | 19.1 | 2.3 | 21.1 | 7.0 | 13.8 | |
| New York City | 20 | 10:00 | A 66 | 2.1 | 2.6 | 7.7 | 7.7 | 17.8 | 8.5 | 18.2 | 3.1 | 19.1 | 7.9 | 13.2 | |
| " | 20 | 5:00 | P 71 | 2.5 | 3.6 | 8.2 | 8.2 | 19.4 | 9.2 | 19.7 | 3.7 | 21.2 | 8.7 | 13.9 | |
| " | 21 | 11:00 | A 70 | 3.2 | 3.3 | 8.8 | 8.8 | 23.3 | 10.0 | 22.8 | 4.0 | 24.3 | 9.5 | 14.3 | |
| " | 21 | 6:15 | P 68 | 3.7 | 4.4 | 6.1 | 10.1 | 25.9 | 11.3 | 25.9 | 6.0 | 27.3 | 11.0 | 15.3 | |
| " | 22 | 10:00 | A 66 | 7.9 | 6.5 | 10.1 | 12.0 | 26.3 | 13.4 | 26.3 | 7.0 | 27.7 | 12.7 | 16.4 | |
| " | 22 | 6:30 | P 70 | 8.7 | 7.3 | 10.8 | 12.8 | 27.8 | 14.0 | 28.3 | 7.5 | 29.3 | 13.0 | 17.3 | |
| " | 23 | 11:00 | A 78 | 9.7 | 9.3 | 11.8 | 14.8 | 29.8 | 15.5 | 29.3 | 9.0 | 30.3 | 15.0 | 18.8 | |
| " | 23 | 4:00 | P 84 | 10.2 | 10.0 | 12.5 | 15.3 | 32.5 | 17.0 | 32.3 | 10.0 | 32.3 | 15.5 | 19.8 | |
| " | 24 | 11:00 | A 65 | 10.6 | 10.3 | 12.6 | 15.8 | 28.8 | 17.3 | 28.8 | 10.8 | 29.6 | 16.0 | 20.1 | |
| " | 24 | 6:00 | P 84 | 11.5 | 11.3 | 13.7 | 16.2 | 28.2 | 17.9 | 28.4 | 11.3 | 29.8 | 17.0 | 20.4 | |
| " | 25 | 7:45 | A 52 | 11.9 | 11.7 | 13.4 | 16.5 | 27.7 | 18.3 | 27.4 | 11.9 | 28.3 | 17.0 | 20.3 | |
| " | 25 | 4:00 | P 60 | 11.6 | 12.3 | 13.8 | 16.7 | 28.4 | 18.5 | 28.4 | 12.3 | 29.7 | 17.4 | 20.4 | |
| " | 26 | 8:15 | A 50 | 11.3 | 12.4 | 13.0 | 16.8 | 25.5 | 18.6 | 25.4 | 13.0 | 26.1 | 18.0 | 20.5 | |
| " | 26 | 3:00 | P 67 | 12.1 | 13.1 | 13.1 | 17.6 | 25.9 | 19.4 | 25.9 | 13.8 | 26.9 | 18.6 | 20.9 | |
| " | 27 | 8:00 | A 56 | 12.4 | 13.1 | 13.3 | 17.8 | 26.4 | 19.5 | 26.2 | 14.0 | 27.2 | 19.0 | 21.4 | |
| " | 27 | 4:00 | P 74 | 13.2 | 14.3 | 14.8 | 19.0 | 25.8 | 20.7 | 28.1 | 15.0 | 29.3 | 20.6 | 22.7 | |
| 60 St. | 28 | 7:30 | A 56 | 12.8 | 14.1 | 13.8 | 18.4 | 30.8 | 20.3 | 30.3 | 15.0 | 31.3 | 20.2 | 23.1 | |

760 St.

While en route it is customary to compare the air and product temperatures for the purpose of determining the most efficient method of refrigeration and the type of refrigerator car which holds the most satisfactory temperatures. SRL 3028, basket bunker car, had the highest rise in temperature of all the cars in the test, even though having approximately 4 inches of insulation. Apparently this was due to the low temperature at which the commodity was loaded, and the opinion was that other cars in the test would have given approximately the same results. Refrigerator cars of present construction are not built to maintain such low temperatures. The average meat temperature on arrival was satisfactory.

The balance of the basket bunker cars held approximately the same temperatures considering the percentages of salt and ice used and considering the amount of insulation in each car. The performance of all brine tank cars was similar. These cars required more time for precooling and carried higher transit temperatures than the basket type bunker cars. It should be noted, however, that the temperatures of the product loaded in ARL 11690, ARL 11628, and WCL 8276 was considerable higher, when loaded into the car, than that of the other shipments.

All the cars in the test showed a steady rise in temperature from September 17 to September 23. From the latter date to September 28, inclusive, the product temperatures were held with slight variation. It was possible to hold the temperatures, with the exception of SRL 4114, which showed a continuous rise without interruption.

ARL 11628 showed an average meat temperature on September 17 of 11.0°F.; on September 23 instructions were changed from 20 to 30 percent of salt, at which time the brine was drained from the tank and replenished with ice and salt to full capacity. From the 23d to the 28th it was possible to hold the average temperature of the lading within 1° F.



ARL 11628 showed an average meat temperature on September 17 of 8.7° F. On September 19, at Selkirk, N. Y., instructions were changed from 10 percent salt to 30 percent salt. At this point the brine tanks were drained and replenished with ice and salt to full capacity. The temperature continued to rise until it reached 22° F. on September 23, after which time it held steady within 1° F. until unloaded at ship side on September 28.

WCL 8876 showed an average meat temperature on September 17 of 10.3° F. On September 23 an average meat temperature of 22° F. was shown. With careful handling in the reicing, forcing ice deep into the tank, the brine overflowed and the temperature was held within a 1° F. rise.

FGE 36713 showed an average meat temperature on September 17 of 5.6° F. There was a rise of 6.1° F. in the first 2 days, and then the temperature held fairly steady until the 21st. On the 23d an average meat temperature of 17° F. was shown, and from the 23d to the 28th, it held within a 1° F. rise.

FGE 38170 showed an average meat temperature on September 17 of 4.6° F. There was a rise of 4.5° F. for the first 2 days with a drop in meat temperature for the next 2 days; with a rise of 14.8° F. on September 23, after which time it was possible to bring the temperature down approximately 3° F. during the holding period from the 23d to the 28th.

FGE 38088 had an average meat temperature on September 17 of 5° F. The meat temperature in this car acted very much as that of FGE 38170, except that there was a slight rise in the last 2 days of holding on the track in New York City.

IDT 8087 showed an average meat temperature on September 17 of 4.7° F. There was a gradual rise in temperature for the first 24 hours and then the temperature held fairly steady until the 25th, at which time it reached 13.5° F. and held very close to that point for the balance of the holding

period.

MDT 3037 showed an average meat temperature on September 17 of 0.5° F.

For the first 2 days there was a sharp rise in temperature, up to 8.7° F. and then a drop of 1.5° F. for the next 24 hours followed by a gradual rise until September 25, at which time the average meat temperature was 14.3° F and it held within 1° F. of this average for the balance of the holding period.

SRL 4114 showed an average meat temperature on September 17 of 0.3° F. and a steady rise in temperature during the entire transit and holding period. Even though this car was well insulated and the loading was wrapped in five layers of heavy paper, it was impossible to hold the temperature at any point.

SRL 3028 showed an average meat temperature on September 17 of 5.2° F. and a steady rise in temperature was noted until September 28 after which it held fairly even for the last 2 days.

SRL 2327 showed an average meat temperature on September 17 of 1.8° F. and a steady rise in temperature until September 24, after which time it held within 1° F. for the remainder of the holding period.

SRL 2483 showed an average meat temperature on September 17 of 0.1° F.

This car also showed a steady rise in temperature until September 23, after which it was possible to hold the temperature, within approximately 1° F., for the balance of the holding period in New York.

RECOMMENDATIONS

All refrigerator cars used for shipments of frozen meats should be equipped with either permanent or temporary wall racks and floor racks.

All refrigerator cars shall be precooled for approximately 24 hours, and cars not able to maintain an average air temperature lower than 25° F., shall be considered unsuitable equipment.

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RECOMMENDATIONS (Cont'd)

From the data accumulated on this test, it appears that for the most satisfactory product temperature, the product should be loaded into refrigerator cars at a temperature of not higher than 5° F. above zero.

In order to insure good arrival temperatures, inspectors should inspect the interior of the car for air leaks around the doors, hatches, and the drain pipes; also see that the space underneath the ice grates is clear for the free circulation of air through the lading.

From April 15 to November 1, inclusive, all shipments should be transported in full basket type bunker refrigerator cars with 30 percent salt; reiced to capacity at all regular icing stations, using coarse ice and rock salt.

From November 1 to April 15, inclusive, brine tank cars may be used with 15 to 20 percent salt, with one or two reicings in transit at which time the brine tanks should be drained. The brine tanks should be drained before replenishing with ice. The reicings depend largely on weather conditions.

The reason for recommending the use of coarse ice instead of crushed ice is that coarse ice allows a larger amount of air to circulate between the larger pieces of ice, which gives added circulation through the lading and more efficient refrigeration.

APPENDIX A

BRINE TANK REFRIGERATOR CAR

The brine tank car is an insulated car equipped with brine tanks and usually without ventilating devices. Designed primarily for the combined use of crushed ice and salt. This type of equipment is used principally for fresh meats and packing-house products.

The Armour and Swift brine tanks are constructed with four tanks in each end of the car and are equipped with valves so that the tanks may be drained and replenished with ice and salt at all regular icing stations.

COMBINATION BRINE TANK AND BASKET BUNKER CAR

This type of car has a basket bunker in each end of the car with a brine tank on each side of the basket bunker. In other words, this car has two brine tanks in each end. There is no provision made for draining the brine from the tanks while the car is under load. In order to properly reice these cars, it is necessary to force cakes of ice into the tank causing the brine in the tank to overflow into the ice bunker and then down through the drain pipe. This type of car might be more practical if drain valves were placed under the cars so that, when reicing, the necessary amounts of ice and salt could be placed into the tanks. This type of tank also retains 18 inches of old brine so that, when initial ice is furnished, it is imperative to cool the old brine remaining in the tank.

BASKET BUNKER CARS

This type of refrigerator car is most commonly used for shipment of all perishable commodities. The bunkers are compartments built in the ends of the car to accommodate from 10,000 to 14,000 pounds of ice. With the use of coarse ice, which gives more air circulation than crushed ice, this type of car allows more efficient refrigeration and can hold the lading at

more satisfactory temperatures than any other equipment, except possibly the overhead bunker car.

Two of the Swift Co. refrigerator cars were equipped with what is known as salt shakers. The salt shaker is a container located in the top of the bunker which holds approximately 100 pounds of salt. As the ice melts, this container tips over and with the motion of the moving car spreads the salt over the ice. These shakers were not in use during the test. One Swift car was equipped with ten flues in each bunker to increase the circulation of air. This, no doubt, is a well developed improvement; however, these flues should be covered with 1/4 inch mesh wire to prevent the rock salt from salt from pouring down into the bottom of the bunker and thereby avoiding interference with the circulation of air.

SIDE WALL RACKS

These racks are a permanent installation in cars used for transportation of frozen commodities. The purpose of the wall racks is to keep an air space between the wall of the car and the lading to allow the circulation of air, giving added protection to the lading. Both temporary and permanent racks are used.

FLOOR RACKS

The Fruit Growers Express and the Merchants Dispatch cars are equipped with permanent floor racks; however, the packer cars are not so equipped. It is necessary to place temporary floor racks in their cars to furnish a blanket of cold air between the floor and the lading to allow a circulation of cold air to flow from the bunkers through the lading, and to provide more efficient refrigeration.

CHARGES FOR REFRIGERATION SERVICES USED IN THE TEST CARS

| DATE | PLACE WHERE ICE WAS FURNISHED | ARL 11690 | ARL 11626 | WCL 8976 | MDT 8037 | MDT 8087 | SRL 4114 |
|------|---|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| 1943 | | ICE SALT SWITCH. | ICE SALT SWITCH. | ICE SALT SWITCH. | ICE SALT SWITCH. | ICE SALT SWITCH. | ICE SALT SWITCH. |
| 16 | Chicago, Illinois | \$ 10.13 6.98 | 10.25 3.54 | 14.58 10.06 | 23.06 26.50 | 28.32 27.23 | 13.77 9.49 |
| 17 | Chicago, Illinois | 3.82 2.61 | 2.95 1.01 | 1.74 1.20 | 3.79 4.50 | 2.83 2.93 | 5.98 4.11 |
| 18 | Chicago, Illinois | 1.90 1.31 | 1.62 .55 | .80 | .80 | .80 | .80 |
| 19 | Buffalo, N. Y. | | | 1.37 .90 | 3.89 3.57 | 3.42 3.38 | 2.28 1.50 |
| 20 | Buffalo, N. Y. | | | 1.19 .78 | 1.82 1.80 | 1.82 1.80 | 1.82 1.20 |
| 21 | Selkirk, N. Y. | 4.72 3.11 | 1.60 1.58 | .91 | 1.69 1.67 | 1.75 1.73 | 1.37 .90 |
| 22 | New York, N. Y. | 20.57 14.01 | 3.23 4.01 | 2.28 1.60 | 2.73 2.70 | 3.42 3.38 | 3.30 2.18 |
| 23 | New York, N. Y. | 20.57 14.01 | 3.20 19.65 10.59 | 4.00 22.07 15.03 | 4.80 36.78 39.74 | 4.80 39.56 40.45 | 28.52 19.38 |
| 24 | Total Charge for initial ice, transit icing and salt to New York, N. Y. | \$ 37.78 | \$ 32.40 | \$ 41.90 | \$ 81.32 | \$ 84.81 | \$ 52.70 |
| 25 | New York, N. Y. | 2.86 2.93 | 3.42 3.38 | 2.32 1.53 | 5.69 5.63 | 6.03 5.96 | 2.51 1.65 |
| 26 | New York, N. Y. | 2.05 2.03 | 2.73 2.70 | 1.82 1.20 | 3.42 3.38 | 2.83 2.93 | 1.64 1.08 |
| 27 | New York, N. Y. | 2.28 2.25 | 2.28 2.25 | 2.61 1.65 | 3.19 3.15 | 2.62 2.59 | 1.94 1.28 |
| 28 | New York, N. Y. | 2.28 2.25 | 2.45 2.45 | 2.11 1.39 | 2.12 2.59 | 2.28 2.25 | 1.43 .98 |
| 29 | New York, N. Y. | 1.37 1.35 | 1.82 1.80 | 1.14 .75 | 2.05 2.03 | 1.60 1.58 | 1.31 .87 |
| 30 | Total Charges for Ice and Salt | \$ 31.41 24.82 7.20 | \$ 32.35 25.27 8.00 | \$ 31.97 21.55 8.80 | \$ 53.25 56.52 8.80 | \$ 54.92 55.76 8.80 | \$ 37.40 25.42 8.80 |
| 31 | | \$ 63.43 | \$ 63.62 | \$ 62.32 | \$ 118.57 | \$ 119.48 | \$ 71.44 |
| 32 | Cort of ice as published in Section 4 of the National Perishable Protective Tariff #12 ICC #19. | | | | | | |
| 33 | Cort of ice in Illinois \$4.35 per ton. | | | | | | |
| 34 | Cort of ice in New York and Ohio \$4.55 per ton. | | | | | | |
| 35 | Cort of salt as published in Section 4 of the National Protective Tariff #12 ICC #19. | | | | | | |
| 36 | The charge for salt in all states is 75¢ per 100 lbs. | | | | | | |
| 37 | The switching charge of 80¢ as prescribed in Docket #20769. | | | | | | |
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